Vol. XV. — No. 5. May 1933.

BULLETIN

OF THE

INTERNATIONAL RAILWAY CONGRESS

ASSOCIATION

(ENGLISH EDITION)

[385. (06 .111]

XIIth SESSION

CAIRO 19-30 JANUARY 1933

SUMMARY OF PROCEEDINGS

SUMMARY

Pages.

List of the papers published 432

Programme of events 436

List of the participating Administrations and affiliated Organisations 439

General list of delegates:

I. Delegates of the Permanent Commission 444

II. Members appointed by adherent Governments and by affiliated Railway Administrations and Organisations 448

Alphabetical index of delegates who attended the Congress 458

Opening ceremony of the Session 468

General officers of the Session 473

Officers of sections 475

Programme of sectional meetings 478

Summary report of discussions in sections:

Section I 480

— II 492

— III 504

— IV 517

— V 529

General meetings and closing ceremony 535

List of members of the Permanent Commission and Secretary's Office 542

Receptions and excursions 546

List of the papers published.

NUMBER of the question.	TITLE OF THE QUESTION.	DOCUMENTS.	YEAR 1932, MONTH AND PAGE of the English *Bulletin*.	NUMBER of the separate issue.
		Section I. — Way and Works.		
I	The protection of level crossings in view of modern developments in road traffic.	*1st Report* (America, Great Britain, Dominions and Colonies, China, Japan and Egypt), by Mr. M. A. NEWLANDS.	April, p. 329.	2
		2nd Report (Belgium, Spain, France, Italy, Netherlands, Portugal and their Colonies, Denmark, Finland, Luxemburg, Norway, Sweden and Switzerland), by Mr. BATICLE.	August, p. 1641.	25
		3rd Report (All countries except America, Great Britain, Dominions and Colonies, China, Japan, Egypt, Belgium, Spain, France, Italy, Holland, Portugal and their Colonies, Denmark, Finland, Luxemburg, Norway, Sweden, and Switzerland), by Mr. A. MISKZE.	July, p. 1283.	20
II	The use of mechanical appliances in the permanent way maintenance and in track relaying.	*1st Report* (United States of America, Great Britain, Dominions and Colonies, China and Japan), by Mr. F. M. THOMSON.	May, p. 661.	7
		2nd Report (Latin America, Belgium, Spain, France, Italy, Netherlands, Portugal and their Colonies; Denmark, Finland, Luxemburg, Norway, Sweden and Switzerland), by Messrs. D. MENDIZABAL FERNANDEZ and J. GARCIA GARIN.	August, p. 1567.	24
		3rd Report (All countries except America, Great Britain, Dominions and Colonies, China, Japan, Belgium, Spain, France, Italy, Holland, Portugal and their Colonies, Denmark, Finland, Luxemburg, Norway, Sweden and Switzerland, by Mohamed Kamel EL KHISHIN, Bey.	June, p. 953.	14
III	The relationship between the vehicle and the track, to ensure safety at high speeds.	*1st Report* (America, Great Britain, Dominions and Colonies, China and Japan), by Messrs. S. MATSUNAWA, S. KUROKOCHI and K. ASAKURA.	June, p. 1045.	16
		2nd Report (All counties except America, Great Britain, Dominions and Colonies, China, Japan, Germany, Denmark, Finland, Norway, Spain, Netherlands, Portugal and their Colonies, Sweden and Switzerland), by Mr. HYNEK DEYL.	November, p. 2141.	36
		3rd Report (Germany, Denmark Finland, Norway, Spain, Netherlands, Portugal and their Colonies, Sweden and Switzerland), by Messrs. H. BAUMANN and F. JAEHN.	December, p. 2251.	37

NUMBER of the question.	TITLE OF THE QUESTION.	DOCUMENTS.	YEAR 1932, MONTH AND PAGE of the English *Bulletin*.	NUMBER of the separate issue.
	Section II. — Locomotives and Rolling Stock.			
IV	Methods to be used to increase the mileage run by locomotives between two repairs including lifting.	*1st Report* (America, Great Britain, Dominions and Colonies, China and Japan), by Sir Henry FOWLER.	April, p. 287.	1
		2nd Report (Germany, Denmark, Finland, Norway, Spain, Netherlands, Portugal and their Colonies, Sweden and Switzerland), by Mr. E. STUDENT.	June, p. 983.	15
		3rd Report (All countries except America, Great Britain, Dominions and Colonies, China, Japan, Germany, Denmark, Finland, Norway, Spain, Netherlands, Portugal and their Colonies, Sweden and Switzerland), by Mr. R. KLATOVSKY.	August, p. 1539.	23
V	Electrification of railways from an economic point of view. Selection of sites for generating stations. Choice of the kind of current. Safety precautions, etc.	*1st Report* (America, Great Britain, Dominions and Colonies, China and Japan), by Mr. S. WITHINGTON.	April, p. 379.	3
		2nd Report (Belgium, Spain, France, Italy, Netherlands, Portugal and their Colonies, Denmark, Finland, Luxemburg, Norway and Sweden), by Messrs. JAPIOT and LEBOUCHER.	September, p. 1717.	26
		3rd Report (All countries except America, Great Britain, Dominions and Colonies, China, Japan, Belgium, Spain, France, Italy, Holland, Portugal and their Colonies, Denmark, Finland, Luxemburg, Norway and Sweden), by Messrs. E. HUBER-STOCKAR and H. ECKERT.	June, p. 857.	12
VI	All-metal rolling stock: carriages and wagons. Use of light metals and alloys. Use of autogenous welding.	*1st Report* (America, Great Britain, Dominions and Colonies, China and Japan), by Mr. H. N. GRESLEY.	August, p. 1467.	22
		3rd Report (All countries except America, Great Britain, Dominions and Colonies, China, Japan, Germany, Bulgaria, Denmark, Finland, Norway, Netherlands and Colonies, Rumania, Sweden, Czechoslovakia and Turkey), by Mr. R. MARIANI.	October, p. 1839.	34
		3rd Report (Germany, Bulgaria, Denmark, Finland, Norway, Netherlands and Colonies, Rumania, Sweden, Czechoslovakia and Turkey), by Mr. E. DAHNICK.	November, p. 2059.	30
	Section III. — Working.			
VII	Allocation of freight rolling stock. Investigation into the turn-round of goods vehicles. Separation of the elements included in it. Methods of reducing the period of turn-round.	*1st Report* (Germany, Denmark, Finland, Great Britain, Dominions and Colonies, Sweden, America, China, Japan, Norway, Netherlands and Colonies), by Mr. W. F. H. VAN RYCKEVORSEL.	May, p. 609.	5
		2nd Report (Belgium, Spain, France, Italy, Portugal and their Colonies, Luxemburg and Switzerland), by Mr. O. GAEREMYNCK.	July, p. 1259.	19
		3rd Report (All countries except Belgium, Spain, France, Italy, Portugal and their Colonies; Luxemburg, Switzerland, Germany, Denmark, Finland, America, Great Britain, Dominions and Colonies, China, Japan, Sweden, Norway, Netherlands and Colonies), by Mr. J. DOLINAR.	October, p. 1911.	31

NUMBER of the question.	TITLE OF THE QUESTION.	DOCUMENTS.	YEAR 1932, MONTH AND PAGE of the English *Bulletin*.	NUMBER of the separate issue.
VIII	Organisation for carrying small consignments of goods and the most suitable methods for their delivery with the least delay. Use and selection of fixed and mechanical transhipping plants.	*1st Report* (Belgium, France, Spain, Holland, Portugal and their Colonies, Switzerland, Denmark, Finland, Luxemburg, Norway and Sweden), by Messrs. HAUTERRE and MERMONT.	June, p. 907.	13
		2nd Report (All countries except America, Great Britain, Dominions and Colonies, China, Japan, Belgium, France, Spain, Holland, Portugal and their Colonies, Switzerland, Finland, Luxemburg, Norway and Sweden), by Mr. C. FETTARAPPA.	May, p. 621.	6
		3rd Report (America, Great Britain, Dominions and Colonies, China and Japan), by Mr. E. MINSART.	September, p. 1777.	27
IX	Automatic train control and train stop. Track equipment. Locomotive fittings. Methods used for repeating signals on the locomotives. Devices intended to ensure the attention of the drivers.	*1st Report* (All countries except America, Great Britain, Dominions and Colonies, China, Japan, Belgium, Spain, France, Italy, Netherlands, Portugal and their Colonies, Denmark, Finland, Luxemburg, Norway and Sweden), by Mr. W. STACKEL.	May, p. 811.	11
		2nd Report (America, Great Britain, Dominions and Colonies, China and Japan), by Mr. G. H. CROOK.	May, p. 705.	8
		3rd Report (Belgium, Spain, France, Italy, Netherlands, Portugal and their Colonies, Denmark, Finland, Luxemburg, Norway, Sweden and Switzerland), by Mr. V. VLAIKOFF.	October, p. 2023.	33
		Section IV. — General.		
X	Instances of the application in a railway department of the scientific organisation of work. Co-operation of the staff towards increased efficiency and its participation in the profits.	*1st Report* (Belgium, Spain, France and their Colonies, Great Britain, Dominions and Colonies, Luxemburg, Holland, Portugal and their Colonies), by Messrs. E. SOULEZ and M. BLOCH.	July, p. 1329.	21
		2nd Report (All countries except Spain, Portugal, France, Great Britain, Dominions and Colonies, Belgium, Luxemburg, Holland, Denmark, Norway, Sweden, Finland, Germany, Switzerland, Czechoslovakia, Bulgaria, Greece, Rumania, Jugoslavia, Turkey and Poland), by Messrs. L. TOSTI and C. VALERI.	July, p. 1211.	18
		3rd Report (Denmark, Norway, Sweden, Finland, Germany, Switzerland, Czechoslovakia, Bulgaria, Greece, Rumania, Jugoslavia, Turkey and Poland), by Messrs. MEREUTZA and PANAITOPOL.	October, p. 1923.	32
XI	Competition between or joint working of railways and airways, or railways and roadways. An investigation from the technical, commercial and contractual points of view.	*1st Report* (America, Great Britain, Dominions and Colonies, China and Japan), by Mr. E. C. COX.	May, p. 729.	9
		2nd Report (All countries except America, Great Britain, Dominions and Colonies, China and Japan), by Messrs. F. P. VILLAMIL and E. D'OCON CORTES.	November, p. 2113.	35

NUMBER of the question.	TITLE OF THE QUESTION.	DOCUMENTS.	YEAR 1932, MONTH AND PAGE of the English *Bulletin*.	NUMBER of the separate issue.
	Section V. — Light railways and colonial railways.			
XII	Co-ordination of operation as between heavy and light railways.	*1st Report* (Continent of Europe), by Mr. L. JACOBS.	May, p. 775.	10
		2nd Report (All countries except the Continent of Europe), by Mohamed SOBHI ISHAK Effendi.	September, p. 1793.	28
XIII	Use of rail motor cars on secondary lines.	*1st Report* (Great Britain, Dominions and Colonies, United States of America, China and Japan), by Mr. A. D. J. FORSTER.	April. p. 451.	4
		2nd Report (Continent of Europe, except Italy), by Mr. F. LEVEL.	June, p. 1133.	17
		3rd Report (Italy and Colonies, Africa, except the British Dominions and Colonies, Latin America), by Messrs. LA VALLE and MELLINI.	September, p. 1801.	29

PROGRAMME OF EVENTS

Monday, 16 January 1933.

At 2.30 p. m. — Reception by the Municipality of Alexandria.

Wednesday, 18 January.

At 11 a. m. — Meeting of the Permanent Commission.

At 12.0 noon. — Reception of the Delegates by the Permanent Commission at the Heliopolis Palace Hotel, Heliopolis.

Thursday, 19 January.

At 11 a. m. — Formal Opening of the XIIth Congress at the Royal Opera House, Cairo, under the presidency of H. M. King Fouad Ist.

Election of the President and Officers of the Session.

Friday, 20 January.

At 9 a. m. — Each section meets under the temporary presidency of one of the members of the Permanent Commission, to elect its officers.

At 9.30 a. m. — Sectional Meetings.

At 10 a. m. — Motor trip through Cairo (Excursion arranged for the families of Members by courtesy of the International Sleeping Car-Cook Company), Group A.F.

Afternoon, from 1.30 p. m. to 6.30 p. m. — Excursions Nos. 1 to 5 (*).

Evening, at 9 p. m. — Entertainment at the Oriental Music Club.

Saturday, 21 January.

Morning, at 9.30 a. m. — Sectional Meetings.

At 10 a. m. — Motor trip through Cairo (Excursion arranged for the families of Members by courtesy of the International Sleeping Car-Cook Company), Group B.F.

Afternoon, from 1.30 to 6.30 p. m. — Excursions Nos. 1 to 5.

Evening, at 9.30 p. m. — Reception by H. M. King Fouad Ist. at the Abdine Palace.

Monday, 23 January.

Morning, at 9.30 a. m. — Sectional Meetings.

At 10 a. m. — Motor trip through Cairo (Excursion arranged for the families of Members by courtesy of the International Sleeping Car-Cook Company), Group C.F.

Afternoon, from 1.30 to 6.30 p. m. — Excursions Nos. 1 to 5.

(*) *Trips through Cairo and vicinity :*

No. 1. — Mosque of Amr, Coptic Church and Museums (Old Cairo).

No. 2. — Pyramids, Sphinx, Sphinx Temple; Tea at Mena House; Fantasia.

No. 3. — Citadel, Mosques of Mohamed Ali and Sultan Hassan, Arabian Art Museum.

No. 4. — By motor car to Memphis and Sakkarah. Visit of the Tombs of the Sacred Oxen and the Tombs of Tih and Ptah-Hotep.

No. 5. — By boat to the Dams. Visit of the Gardens, the Great Dam and the Museum (Model House) containing the small-scale models of the various Nile Dams and those of the Egyptian Irrigation Works. Tea on board.

Tuesday, 24 January.

Morning, at 9.30 a. m. — Plenary Meeting.

At 11.30 a. m. — Joint Meeting of Sections II and III.

At 10 a. m. — Motor trip through Cairo (Excursion arranged for the families of Members by courtesy of the International Sleeping Car-Cook Company), Group D.F.

Afternoon, from 1.30 to 6.30 p. m. — Excursions Nos. 1 to 5.

Evening, at 8.30 p. m. — Banquet given by H. E. the Minister of Communications at the Heliopolis Palace Hotel.

Wednesday, 25 January.

Morning, at 9.30 a. m. — Sectional Meetings.

At 11 a. m. — Joint Meeting of Sections III and IV.

At 10 a. m. — Motor trip through Cairo (Excursion arranged for the families of Members by courtesy of the International Sleeping Car-Cook Company), Group E.F.

Afternoon, at 3 p. m. — Joint Meeting of Sections II and III.

From 1.30 to 6.30 p. m. — Excursions Nos. 1 to 5.

Thursday, 26 January.

Morning, at 9.30 a. m. — Sectional Meetings.

At 11.30 a. m. — Joint Meeting of Sections II and III.

Afternoon, at 3 p. m. — Sectional Meetings.

Evening, at 9.30 p. m. — Reception by H. E. the President of the Council of Ministers, at the Semiramis Hotel.

Friday 27, Saturday 28 and Sunday 29 January.

Free (Official holidays).

Monday, 30 January.

Morning, at 9.30 a. m. — Plenary Meeting.

At 12.0 noon. — Closing Ceremony under the presidency of H. E. the Minister of Communications.

End of Official Programme.

Excursions into Upper Egypt.

a) LUXOR.

Programme :

Tuesday, 31 January.

Morning, at 7.30 and 7.50 a. m. — Departure from Cairo for Luxor. — En route : Lunch, tea, dinner.

Evening, at 8.15 and 8.40 p. m. — Arrival at Luxor.

Wednesday, 1 February.

Morning, at 9 a. m. — Visit of the Temple of Kurna and of the Tombs of the Kings. — Lunch at Cook's Rest House.

Afternoon. — Visit of the Temple of Queen Hatasu, the Tomb of Queen Nefertari, the Temple of Medinet-Habu, the Temple of Rhamses, the Ramesseum, the Colosses of Memnon, etc.

Thursday, 2 February.

Morning, at 9 a. m. — Visit of the Temples of Karnak, Chonsu and Amen.

Afternoon, at 4 p. m. — Visit of the Temple of Luxor (on foot).

Evening, at 8 p. m. — Departure from Luxor for Cairo. En route : Dinner, breakfast.

Friday, 3 February.

Morning, at 8 a. m. — Arrival at Cairo.

b) ASSUAN and LUXOR.

Programme :

Tuesday, 31 January.

Afternoon, at 3.45 p. m. *. — Departure from Cairo for Assuan. En route : Tea, dinner, breakfast.

Wednesday, 1 February.

Morning, at 8.30. — Arrival at Assuan.

Morning. — Visit of the Granite Quarries. Visit (by boat) of the Temple of Philae and the Assuan Dam. Return to the hotel for lunch.

Afternoon. — Free.

Thursday, 2 February.

Morning, at 9 a. m. — Visit of the Beshareen Camp. Visit of the Alabaster Quarries and the Bazars.

Afternoon. — Visit of the Temples of Mechu, Ben and Se-Rempu, the Elephantine Island, the Museum and the Nilometer.

Friday, 3 February.

Morning, at 8 a. m. — Departure from Assuan for Luxor.

At 12.20. — Arrival at Luxor.
Lunch at the hotel.

Afternoon. — Visit of the Temples of Luxor and Karnak.

Saturday, 4 February.

Morning. — Visit of the Temple of Kurna and the Tombs of the Kings.
Lunch at Cook's Rest House.

Afternoon. — Visit of the Temple of Queen Hatasu, the Tomb of Queen Nefertari, the Temple of Medinet-Habu, the Temple of Rhamses, the Ramesseum, the Colosses of Memnon, etc.

Sunday, 5 February.

Morning, at 8 a. m. — Departure from Luxor for Cairo. En route : Lunch, tea.

Evening, at 8 p. m. — Arrival at Cairo.

---

* A second special train was also run. Departure from Cairo, on Tuesday at 7.0 p. m.; arrival at Assuan on Wednesday morning, at 11.30.

Note. — Owing to the large number of delegates who joined this excursion, they were divided in two groups, the first of which followed the above programme, while the second visited Luxor before going to Assuan.
The excursion was scheduled as follows as regards this second group.

Tuesday, 31 January.
Departure from Cairo at 7.30 and 7.50 a. m.
Arrival at Luxor at 8.15 and 8.40 p. m.

Friday, 3 February.
Departure from Luxor at 7.5 a. m.
Arrival at Assuan at 11.30 a. m.

Saturday, 4 February.
Departure from Assuan at 3 p. m.

Sunday, 5 February.
Arrival at Cairo at 7.30 a. m.

List of the participating Administrations and affiliated Organisations.

(Position in 1932.)

ADMINISTRATIONS.	Km.	*Miles.*
ALLEMAGNE (GERMANY).		
Deutsche Reichsbahn Gesellschaft.	53 826	33 446
ARGENTINE.		
Chemins de fer de l'Etat	7 656	4 757
Buenos Ayres Great Southern Railway	8 061	5 009
Buenos Ayres and Pacific Railway.	4 515	2 806
Buenos Ayres Western Railway. .	3 101	1 927
Central Argentine Railway . . .	5 640	3 505
Entre Rios Railways	1 303	810
Chemins de fer de Rosario à Puerto Belgrano	826	513
Chemins de fer de la province de Santa-Fé	2 055	1 277
AUTRICHE (AUSTRIA).		
Chemins de fer fédéraux autrichiens	5 871	3 648
BELGIQUE (BELGIUM).		
a) *Continent.*		
Société Nationale des chemins de fer belges	4 823	2 997
Chemin de fer de Chimay	61	38
Chemin de fer de Malines à Terneuzen	79	49
Chemin de fer du Nord français (lignes Nord belges)	170	106
Société Nationale des chemins de fer vicinaux.	4 619	2 870
Compagnie d'entreprises électriques et industrielles « Electrobel » . .	38	24
Railways économiques de Liége-Seraing et extensions	21	13
Compagnie belge de chemins de fer et d'entreprises	188	117
b) *Colony.*		
Chemins de fer du Bas-Congo au Katanga	1 984	1 233
Chemins de fer du Congo	400	249
Chemins de fer du Congo Supérieur aux Grands Lacs africains.	763	474
Chemins de fer Vicinaux du Congo.	317	197
BRESIL (BRAZIL).		
Compagnie des chemins de fer de l'Est brésilien	2 293	1 425
Great Western of Brazil Railway. .	1 638	1 018
Chemins de fer de Rio Grande do Sul	2 610	1 622
BULGARIE (BULGARIA).		
Chemins de fer de l'Etat	2 633	1 636
CHILI (CHILE).		
Nitrate Railways.	664	413
Taltal Railway.	264	164
CHINE (CHINA).		
Chemin de fer du Lunghai	1 800	1 118
Chemin de fer de Pékin-Hankow.	1 200	746
Compagnie générale de chemins de fer et de tramways en Chine . .	621	386
South Manchuria Railway	1 125	699
COLOMBIE (COLOMBIA).		
The Colombia Railways and Navigation Company, Limited . . .	106	66
Société Nationale de chemins de fer en Colombie	252	157
DANEMARK (DENMARK).		
Chemins de fer de l'Etat.	2 598	1 614
Chemin de fer privé d'Aalborg . .	259	161
Chemin de fer de l'Est de Seeland.	47	29
Chemin de fer de la Fionie méridionale	216	134
Chemin de fer de Lolland-Falster.	104	65
EGYPTE (EGYPT).		
Chemins de fer de l'Etat.	3 427	2 129
ESPAGNE (SPAIN).		
Chemins de fer Andalous	1 644	1 021
Chemins de fer économiques des Asturies	115	71
Ferrocaril Cantabrico	105	65

ADMINISTRATIONS.	Km.	*Miles.*
Chemins de fer Catalans (réseaux de la Compagnie du chemin de fer Central Catalan, du chemin de fer du Nord-Est de l'Espagne et du tramway ou chemin de fer économique de Manrésa à Berga).	201	125
Chemins de fer Central de Aragon.	302	188
Explotacion de Ferrocarriles por el Estado	273	170
Chemins de fer de Madrid à Saragosse et à Alicante	3 670	2 280
Chemins de fer du Nord de l'Espagne	3 801	2 362
Compagnie Nationale des chemins de fer de l'Ouest de l'Espagne.	1 587	986
Great Southern of Spain Railway.	168	104
Mines et chemin de fer de Utrillas.	127	79
ETATS-UNIS D'AMERIQUE (UNITED STATES OF AMERICA).		
Baltimore and Ohio Railroad	8 791	5 463
Bessemer and Lake Erie Railroad.	364	226
Delaware and Hudson Company.	1 195	743
Erie Railroad	3 585	2 166
Kansas City Southern Railway	1 421	883
Lehigh and New England Railroad.	349	217
Long Island Railroad	634	394
New York Central Railroad	10 243	6 365
Pennsylvania Railroad System	17 646	10 898
Pittsburgh, Shawmut and Northern Railroad	319	198
Reading Company	2 527	1 570
Richmond, Fredericksburg and Potomac Railroad	188	117
FINLANDE (FINLAND).		
Chemins de fer de l'Etat.	5 011	3 116
FRANCE, ALGERIE ET TUNISIE, COLONIES ET PROTECTORATS (FRANCE, ALGIERIA AND TUNISIA, COLONIES AND PROTECTORATES).		
a) *France.*		
Chemins de fer de l'Etat	9 134	5 676
Chemins de fer d'Alsace et de Lorraine.	2 103	1 307
Chemins de fer de Ceinture de Paris.	179	111
Chemins de fer de l'Est	5 104	3 172
Chemins de fer du Midi	4 310	2 678
Chemin de fer du Nord	3 830	2 380
Chemins de fer de Paris à Orléans.	7 831	4 866
Chemins de fer de Paris à Lyon et à la Méditerranée	9 884	6 142
Chemins de fer du Cambrésis	120	75
Chemins de fer Départementaux.	1 927	1 197
Régie Départementale des chemins de fer et tramways électriques des Bouches-du-Rhône	175	109
Chemins de fer Départementaux du Tarn	150	93
Société générale des Chemins de fer Economiques	3 454	2 146
Chemins de fer Economiques du Nord.	247	153
Chemins de fer de l'Est de Lyon.	104	65
Voies ferrées des Landes	363	226
Chemin de fer Secondaire du Nord-Est	646	401
Chemin de fer de Somain à Anzin et à la frontière belge	37	23
Chemins de fer de la Provence	474	295
Chemins de fer du Sud-Ouest	400	249
Compagnie générale des chemins de fer vicinaux	720	447
Compagnie générale de Voies ferrées d'intérêt local	502	312
Régie départementale des Tramways de l'Ain	436	271
Tramways départementaux des Deux-Sèvres	198	123
Tramways de l'Indre	182	113
Société des transports en commun de la région parisienne	1 010	628
b) *Algeria and Tunisia.*		
Chemins de fer algériens de l'Etat.	3 640	2 262
Chemins de fer algériens de la Compagnie de Paris à Lyon et à la Méditerranée	1 235	767
Chemin de fer de Gafsa	441	274
Compagnie fermière des chemins de fer tunisiens	1 609	1 000
c) *Colonies and Protectorates.*		
Africa.		
Chemins de fer coloniaux de l'Afrique occidentale française	3 476	2 160
Chemin de fer de Dakar à St-Louis.	392	244
Chemin de fer franco-éthiopien de Djibouti à Addis-Abeba	783	487
Chemins de fer du Maroc	579	360
Chemin de fer du Port et de la Pointe des Galets (Réunion-Island)	127	79

ADMINISTRATIONS.	Km.	*Miles.*
Asia.		
Chemin de fer Bozanti-Alep-Nissibine et prolongements. . . .	886	551
Chemin de fer de Damas-Hamah et prolongements	583	363
Chemins de fer coloniaux de l'Indochine	1 405	873
Compagnie française des chemins de fer de l'Indochine et du Yunnan	860	535
GRANDE-BRETAGNE ET NORD DE L'IRLANDE, INDES, DOMINIONS, PROTECTORATS ET COLONIES (GREAT BRITAIN AND NORTHERN IRELAND, INDIA, DOMINIONS, PROTECTORATES AND COLONIES).		
a) *Great Britain and Northern Ireland.*		
Great Western Railway	5 945	3 696
London Midland and Scottish Railway	11 204	6 962
London and North Eastern Railway.	10 433	6 483
Southern Railway	3 513	2 181
Cheshire Lines Committee	230	143
Great Northern Railway (1) . . .	896	557
Isle of Man Railway	74	46
Metropolitan Railway	127	79
Underground Electric Railways Company of London	125	77
County Donegal Railways Joint Committee (1)	201	125
Great Central and Midland Joint Committee	63	39
London Midland and Scottish Railway Company (Northern Counties Committee)	449	279
Midland and Great Northern Railways Joint Committee (1) . . .	295	183
b) *India, Dominions, Protectorates and Colonies.*		
Africa.		
Kenya and Uganda Railway . . .	2 602	1 616
Mashonaland Railway	1 432	890
Nigerian Railway	3 065	1 905
South African Railways and Harbours	20 998	13 048
Sudan Railways	3 205	1 992

ADMINISTRATIONS.	Km.	*Miles.*
America.		
Canada.		
Canadian National Railways . . .	38 251	23 768
Canadian Pacific Railway	25 350	15 752
Asia.		
Ceylon.		
Ceylon Government Railway . . .	1 531	951
India.		
Bengal Nagpur Railway	5 117	3 218
Bengal and North Western Railway.	3 383	2 102
Bombay, Baroda and Central India Railway	6 318	3 926
Burma Railways	3 311	2 057
Eastern Bengal Railway (State Railway of India)	3 048	1 894
East Indian Railway (State Railway of India)	6 907	4 292
Great Indian Peninsula Railway (State Railway of India)	6 024	3 743
Madras and Southern Mahratta Railway	5 200	3 230
North Western Railway (State Railway of India)	11 397	7 082
Rohilkund and Kumaon Railway. .	920	572
South Indian Railway	3 958	2 460
Malay Peninsula.		
Federated Malay States Railways.	1 792	1 113
Mesopotamia.		
Iraq Railways	1 218	757
Australasia.		
New Zealand.		
New Zealand Government Railways.	5 118	3 287
GRECE (GREECE).		
Chemins de fer de l'Etat	1 320	820
Chemins de fer du Nord-Ouest de Grèce	68	42
Chemins de fer Pirée-Athènes-Péloponèse	750	466
Chemins de fer de Thessalie . . .	233	145

(1) Also shewn under Irish Free State.

ADMINISTRATIONS.	Km.	*Miles.*
HONGRIE (HUNGARY).		
Chemins de fer Royaux de l'Etat hongrois	7 244	4 501
IRLANDE (ETAT LIBRE) (IRISH FREE STATE).		
County Donegal Railways Joint Committee (1)	201	125
Great Northern Railway (1)	896	557
Great Southern Railways	3 518	2 186
ITALIE (ITALY).		
Chemins de fer de l'Etat	16 928	10 519
Chemins de fer de la Méditerranée.	456	283
Chemins de fer du Nord de Milan.	266	165
Société Emilienne de chemins de fer, tramways et automobiles	120	75
Société vénitienne pour la construction et l'exploitation de chemins de fer secondaires en Italie	553	344
Chemins de fer de l'Apennin Central	135	84
Chemin de fer Central et Tramways du Canavèse	59	37
Chemin de fer de Reggio-Emilia.	71	44
Chemins de fer complémentaires de la Sardaigne	697	433
Chemin de fer de Suzzara-Ferrara.	82	51
Chemins de fer du Tessin	207	129
Ferrovie del Sud-Est	475	295
Société anonyme des Tramways de Lombardie et Romagne, réseaux de Brescia - Mantoue - Ostiglia - Desenzano et Forli - Meldola - Forli - Ravenne - Classe	125	78
Société Nationale de chemins de fer et de tramways	205	127
Tramways piémontais	189	117
Società Trazione e Ferrovie Elettriche Toscane	41	26
Société sicilienne de travaux publics (Chemin de fer Circumetnea).	120	75
Società Trazione Elettrica Lombarda	105	65
Société turinoise de tramways et de chemins de fer économiques.	76	47
Tramways Vercellesi	112	70
Tramways électriques de Brescia	193	120
JAPON (JAPAN).		
Japanese Government Railways	14 570	9 054
Government General of Chosen, Railway Bureau	2 789	1 733

ADMINISTRATIONS.	Km.	*Miles.*
LUXEMBOURG (LUXEMBURG).		
Chemins de fer Guillaume-Luxembourg	207	129
Chemins de fer et Minières Prince Henri	250	155
MEXIQUE (MEXICO).		
Ferrocarriles Nacionales de Mexico.	12 005	7 460
NORVEGE (NORWAY).		
Chemins de fer de l'Etat.	3 505	2 178
PAYS-BAS (NETHERLANDS).		
a) *Continent.*		
Chemins de fer néerlandais (Compagnie pour l'exploitation des chemins de fer de l'Etat néerlandais + Chemins de fer hollandais).	3 638	2 261
Tramway à vapeur de Breskens à Maldegem	69	43
Tramways à vapeur Sud-néerlandais	100	62
b) *Colonies.*		
Chemins de fer de l'Etat aux Indes néerlandaises	4 330	2 691
Société des chemins de fer aux Indes néerlandaises	863	536
Tramway à vapeur Semarang-Cheribon	388	241
POLOGNE (POLAND).		
Chemins de fer de l'Etat	17 500	10 874
PORTUGAL.		
a) *Continent.*		
Chemins de fer portugais de la Beira-Alta	253	157
Compagnie des chemins de fer portugais	2 463	1 530
Compagnie nationale des chemins de fer portugais	356	221
Companhia Portuguesa para a construção e exploração de caminhos de ferro, Linhas do Vale do Vouga	176	109
b) *Colonies.*		
Chemins de fer de l'Etat	1 049	652
Port et chemins de fer de Lourenço-Marquès	430	267
Chemins de fer du Benguela	1 347	837

(1) Also shewn under Great Britain and Northern Ireland.

ADMINISTRATIONS.	Km.	*Miles.*
ROUMANIE (RUMANIA).		
Chemins de fer de l'Etat	11 129	692
SALVADOR.		
Salvador Railway	161	100
SUEDE (SWEDEN).		
Chemins de fer de l'Etat	6 753	4 204
Chemin de fer Bergslagen	552	343
Chemin de fer Blekinge-Kustbanor.	203	126
Chemin de fer Boras-Herrljunga. .	127	79
Chemin de fer Gefle-Dala	293	182
Chemin de fer Göteborg-Borås et Bors Alfvesta	261	162
Chemin de fer Helsingborg-Hesselholms	122	76
Chemin de fer Kalmar-Nya . . .	195	121
Chemin de fer Karlskrona-Växjö.	114	71
Chemin de fer Nässjö-Oskarshamm.	148	92
Chemin de fer Nora Bergslagen. .	173	107
Chemin de fer Nordsmarks-Klarelfvens	171	106
Chemin de fer Norra-Östergötland .	134	83
Chemin de fer Norsholm-Westervik-Hultsfred	245	152
Chemin de fer Oxelösund-Flen-Västmanlands	300	186
Chemin de fer Stockholm-Roslag.	238	148
Chemin de fer Stockholm-Vesteras-Bergslagen	479	298
Chemin de fer Trafikförbundet Uppsala-Norrland	505	314
Chemin de fer Västergötland-Göteborg	380	236

ADMINISTRATIONS.	Km.	*Miles.*
SUISSE (SWITZERLAND).		
Chemins de fer fédéraux	2 942	1 828
Chemins de fer des Alpes bernoises (Berne-Loetschberg-Simplon). .	253	157
Chemin de fer de la vallée de Birsig	17	11
Chemin de fer Rhétique	276	172
Chemin de fer de Viège à Zermatt.	44	27
Chemin de fer d'Yverdon à Sainte-Croix	25	16
Chemin de fer de Lausanne à Ouchy	2	1.3
TCHECOSLOVAQUIE (CZECHOSLOVAKIA).		
Chemins de fer de l'Etat	12 429	7 723
TURQUIE (TURKEY).		
Chemins de fer de l'Etat	3 040	1 889
Chemin de fer Smyrne-Cassaba et prolongement	701	436
Chemins de fer Bozanti-Alep-Nisibine et prolongements (see also France-Asia)	886	551
URUGUAY.		
Central Uruguay Railway of Montevideo	1 577	980
North Western of Uruguay Railway.	182	113
YOUGOSLAVIE (JUGOSLAVIA).		
Chemins de fer de l'Etat	9 459	5 877

Affiliated Organisations.

American Railway Association.
Compagnie auxiliaire internationale de chemins de fer.
Compagnie internationale des wagons-lits et des grands express européens.
Comité permanent des transports par voies ferrées de la Société des Nations.
Confederazione Nazionale Fascista dei Trasporti terrestri e della Navigazione interna.
Railway Clearing House (Great Britain).
Union internationale des chemins de fer.
Union des chemins de fer privés suédois (Svenska Järnvägsföreningen).
Union des voies ferrées et des transports automobiles.
Premier groupement régional des Chemins de fer européens, membres de l'U. I. C. (Grem).
Mitteleuropäische Schlafwagen- und Speisewagen A. G. (Mitropa).

GENERAL LIST OF DELEGATES

Note. — An asterisk (*) means that a delegate is already a member of the Congress in some other capacity, this latter being inserted in brackets.

◆ = Present at Cairo.

I. — Delegates of the Permanent Commission.

A. — PERMANENT COMMISSION.

President :

◆ **E. Foulon,** directeur général de la Société Nationale des chemins de fer belges (Belgium).

Vice-presidents :

C. Colson, membre de l'Institut, inspecteur général des Ponts et Chaussées, vice-président honoraire du Conseil d'Etat de France, membre du Conseil supérieur des chemins de fer (France);

U. Lamalle, directeur de l'Exploitation à la Société Nationale des chemins de fer belges (Belgium).

Members of the Executive Committee :

◆ The Right Hon. Sir Evelyn **Cecil,** G. B. E., privy councillor, director, Southern Railway (Great Britain);

P. E. Javary, directeur de l'Exploitation de la Compagnie du chemin de fer du Nord (France);

◆ **D. Vickers,** director, London Midland & Scottish Railway.

Ex-Presidents of sessions, ex-officio members :

The Right Hon. Viscount **Churchill,** G. C. V. O., chairman, Great Western Railway (Great Britain);

J. Gaytan de Ayala, ancien président du Conseil des travaux publics (Spain).

Members :

R. H. Aishton, president, American Railway Association;

W. W. Atterbury, president, Pennsylvania Railroad Company;

◆ **F. Besser,** Ministerialrat, Reichverkehrsministerium (Germany);

J. Castiau, secrétaire général du Ministère des Transports (Belgium);

H. Caufriez, directeur général de la Société Nationale des chemins de fer vicinaux (Belgium);

P. A. Clews, European traffic manager, Canadian National Railways;

◆ **R. da Costa Couvreur,** ingénieur en chef de la division de la voie et des travaux de la Direction générale des chemins de fer, membre du Conseil supérieur des chemins de fer du Portugal;

Dautry, directeur général des chemins de fer de l'Etat (France);

A. J. Day, advisory engineer, Office of the High Commissioner for the Union of South Africa;

◆ Sir Francis **Dent,** C. V. O., director, Southern Railway (Great Britain);

de Samarjay, secrétaire d'Etat, président de la Direction Générale des Chemins de fer royaux de l'Etat (Hungary);

◆ Dr. **Dorpmüller,** Generaldirektor der Deutschen Reichsbahn Gesellschaft (Germany);

◆ **F. Fiori,** ingénieur, administrateur des Chemins de fer de l'Etat (Italy);

M. Fontaneilles, inspecteur général des Ponts et Chaussées, président de la section des chemins de fer au Conseil général des Ponts et Chaussées, président du Conseil de réseau des chemins de fer d'Alsace et de Lorraine (France).

◆ Sir Henry **Fowler,** K. B. E., assistant to vice-president (Research & Development), London Midland & Scottish Railway;

◆ Dr. T. **Fukukawa,** Manager of the Berlin Office of the Japanese Government Railways;

◆ **P. Ghilain,** ingénieur en chef au Service du Matériel de la Société Nationale des chemins de fer belges;

A. Granholm, directeur général des chemins de fer de l'Etat (Sweden);

◆ **H. N. Gresley,** C. B. E., chief mechanical engineer, London & North Eastern Railway;

Grimpret, conseiller d'Etat, directeur général des chemins de fer au Ministère des travaux publics (France);

◆ **R. J. Harvey,** consulting engineer to the Government of New Zealand;

A. Henry-Gréard, directeur de la Compagnie du chemin de fer de Paris à Orléans;

◆ **H. Hunziker,** ingénieur, directeur de la division des chemins de fer du Département fédéral des postes et des chemins de fer (Switzerland);

Sir Cyril **Hurcomb,** K. B. E., C. B., secretary to the Ministry of Transport (Great Britain);

◆ **A. Jacques,** directeur de la voie à la Société Nationale des chemins de fer belges (Belgium);

◆ **H. Jezierski,** conseiller ministériel au Ministère des Communications (Poland);

E. Kejr, ingénieur, conseiller des constructions du département V/1 au Ministère des chemins de fer (Czechoslovakia);

P. **Knutzen**, directeur général des Chemins de fer de l'Etat (Denmark);

L. F. **Loree**, president, Delaware & Hudson Railroad;

A. **Mange**, administrateur de la Compagnie du chemin de fer de Paris à Orléans, président du Comité de gérance de l'Union internationale des chemins de fer;

Sir George **McLaren Brown**, K. B. E., European general manager, Canadian Pacific Railway;

C. **Marchi**, député au Parlement, président général de la Confederazione nazionale fascista dei trasporti terrestri e della navigazione interna (Italy);

M. **Margot**, directeur général de la Compagnie des chemins de fer de Paris à Lyon et à la Méditerranée;

A. **Marguerat**, directeur des Compagnies de chemins de fer de Viège à Zermatt, Furka-Oberalp, Gornergrat et Schöllenen (Switzerland);

E. **Maristany**, marquis d'Argentera, directeur général de la Compagnie des chemins de fer de Madrid à Saragosse et à Alicante (Spain);

C. **Mereutza**, sous-directeur général des Chemins de fer (Rumania);

G. **Molle**, secrétaire technique à la Direction générale de la Société Nationale des chemins de fer belges;

L. **Moralès**, vice-président du Conseil supérieur des chemins de fer, président du Conseil d'administration des chemins de fer de l'Ouest de l'Espagne (Spain);

J. **Moreno Ossorio**, directeur de la Compagnie des Chemins de fer du Nord de l'Espagne (Spain);

C. **Oddone**, directeur général honoraire des Chemins de fer de l'Etat (Italy);

Sir Frederic **Palmer**, C. I. E., consulting engineer, Office of the High Commissioner for India;

J. R. **Paul**, directeur général honoraire de la Compagnie des chemins de fer du Midi (France);

G. **Philippe**, inspecteur général des lignes Nord belges (Belgium);

P. **Riboud**, directeur de la Compagnie des chemins de fer de l'Est (France);

N. **Rulot**, directeur du matériel à la Société Nationale des chemins de fer belges;

A. **Schrafl**, président de la Direction générale des Chemins de fer fédéraux (Switzerland);

Dr. Ing. E. **Seefehlner**, Generaldirektor, Österreichische Bundesbahnen (Austria);

Sir Josiah **Stamp**, G. B. E., D. Sc., chairman and president of the Executive, London Midland & Scottish Railway;

Sir Henry W. **Thornton**, K. B. E., chairman and president, Canadian National Railways;

Antonio **Valenciano y Mazerès**, inspecteur général des Ponts et Chaussées, administrateur de la Compagnie des chemins de fer de Madrid à Saragosse et à Alicante (Spain);

H. **van Manen**, directeur des Chemins de fer néerlandais (Netherlands);

Th. M. B. **van Marle**, inspecteur général des chemins de fer et tramways (Netherlands);

L. **Velani**, directeur général des Chemins de fer de l'Etat (Italy);

Sir Ralph Lewis **Wedgwood**, C. B., C. M. G., chief general manager, London & North Eastern Railway;

D. **Willard**, chairman of the Board, American Railway Association; president, Baltimore & Ohio Railroad;

P. **Wolf**, Geheimrat, Direktor der Deutschen Reichsbahn-Gesellschaft und Mitglied des Direktionsausschusses dieser Gesellschaft (Germany);

K. Y. **Woo**, director of the European Bureau of the Ministry of Railways of the National Government, Republic of China.

Honorary Member :

Gustav **Behrens**, director, London Midland & Scottish Railway.

SECRETARY'S OFFICE.

General secretary :

P. **Ghilain** (*).

Assistant secretaries :

R. **Desprets**, ingénieur principal à la Société Nationale des Chemins de fer belges;

E. **Minsart**, ingénieur principal à la Société Nationale des Chemins de fer belges;

A. W. **Chantrell**, ingénieur principal à la Société Nationale des Chemins de fer belges.

Chief of the Secretariat :

V. **Teugels**, Chef de division à la Société Nationale des Chemins de fer belges.

B. — EGYPTIAN LOCAL ORGANISING COMMISSION.

President :

H. E. **Ismaïl Sedky** Pasha, Prime Minister.

Vice-President :

H. E. Ibrahim **Fahmy Kerim** Pasha, Minister of Communications;

H. E. the General Manager of the Egyptian State Railways, Telegraphs and Telephones.

Secretaries :

Youssef Risgallah Bey (*), Member of the Board Management, Egyptian State Railways;

Dr. I. G. **Levi** (*), General Secretary, Egyptian Federation of Industries;

Fouad Hassib Bey, General Secretary, Egyptian Council of Ministers.

Members :

H. E. **Mohamed Chafik** Pasha, Minister of Public Works;

H. E. **Hussein Wassef** Pasha, former Minister, member of the Board of Management, Egyptian State Railways;

H. E. **Abdul Hamid Soliman** Pasha, former Minister, Senator;

H. E. **Mahmoud Choucri Pasha**, former Minister, Chairman of the Board of Management, Crédit Agricole d'Egypte;

◆ H. E. **Youssef Aslan Cattaui** Pasha, former Minister, Senator;

◆ **Mahmoud Chaker** Bey, Under Secretary of State, Ministry of Communications;

◆ H. E. **Ahmed Abdel Wahab** Pasha, Under Secretary of State, Ministry of Finances;

◆ **Mohamed Osman** Bey, Under Secretary of State, Ministry of Public Works;

◆ H. E. **Mahmoud Sedky** Pasha, Governor of Cairo;

◆ **Hassan Rifaat** Bey, Governor of the Suez Canal;

◆ R. E. **Thomas**, Deputy General Manager, Egyptian State Railways, Telegraphs and Telephones;

◆ **Mustapha Hamdi El Kattan** Bey, Chief Engineer, Way and Works, Egyptian State Railways;

◆ P. W. **Weaver**, Traffic Manager, Egyptian State Railways;

◆ B. **Pearson**, former Traffic Manager, Egyptian State Railways;

◆ H. E. **Mohamed Ahmed Abboud** Pasha, Senator, Chairman of the Board of Directors, Egyptian General Omnibus Company.

◆ **Mahmoud Tewfik Ahmed** Bey, Assistant General Manager, Egyptian State Railways, Telegraphs and Telephones;

◆ H. E. **Mohamed Talaat Harb** Pasha, Director, Misr Bank;

◆ Baron Louis **de Benoist d'Erquennes**, Agent supérieur de la Compagnie du Canal Maritime de Suez;

◆ Sir Edward **Cook**, Governor, National Bank of Egypt;

◆ Henri **Naus** Bey, administrateur directeur général de la Société Générale des Sucreries et de la Raffinerie d'Egypte;

◆ Lt. Col. J. R. **Marryat**, Agent and Manager, Egyptian Delta Light Railways;

◆ A. **Zollikofer**, Directeur de la Société Anonyme des Chemins de fer de la Basse-Egypte;

◆ F. **Simon**, Engineer, General Manager, Fayoum Light Railways Company;

◆ Sir Henry **Barker**, proprietor, Messrs. Barker & Co., Alexandria;

◆ E. **Gaudaire**, agent général de la Compagnie des Messageries Maritimes;

◆ Clare **Martin**, General Manager of the Shell Company of Egypt;

◆ Victor **Pêcher**, General Manager, The Cairo Electric Railways & Heliopolis Oases Company;

◆ Léon **Van Der Hecht**, directeur général de la Société Anonyme des Tramways du Caire;

◆ Janig Haig **Chaker**, Agent for Egypt and Palestine, of the International Sleeping Car Company;

◆ E. W. **Slaughter**, Assistant Chief Mechanical Engineer, Egyptian State Railways;

◆ S. R. **Hibbert**, Goods Manager, Egyptian State Railways;

◆ G. H. **Stopford**, Chief Signal Engineer, Egyptian State Railways;

◆ W. T. **Briggs**, Chief Electrical Engineer, Egyptian State Railways;

◆ Charles **Andreae**, directeur de l'Ecole Royale Polytechnique, Gizeh.

◆ J. **Webb**, Inspector General, Egyptian State Telegraphs and Telephones;

◆ A. J. **Boyé**, directeur de l'Ecole Française de Droit, Mounira, Cairo;

◆ C. E. **Blyth**, Chief Mechanical Engineer, Egyptian State Railways;

◆ W. D. **Knight**, Deputy chief Mechanical Engineer, Egyptian State Railways;

◆ F. **Boyd**, Superintendent of Stores, Egyptian State Railways;

◆ **Zaki Fahmy** Bey, Deputy Traffic Manager, Egyptian State Railways;

◆ J. W. **Macaldin**, Deputy Chief Engineer, Way and Works, Egyptian State Railways;

◆ **Abdel Rahman Hamada** Bey, Assistant Chief Mechanical Engineer, Egyptian State Railways;

◆ Dr. **Ibrahim El Chorbagui** Bey, Medical Advisor, Egyptian State Railways;

◆ **Hussein Seid** Bey, Governmental Director, Ramleh Electric Railways.

C. — REPORTERS ON THE QUESTIONS SUBMITTED TO THE CONGRESS.

Dr. K. **Asakura**, chief of the rolling stock section, Department of Railways, Government of Japan;

M. **Baticle**, directeur du contrôle de l'exploitation technique au Ministère des travaux publics (France);

◆ Prof. H. **Baumann**, Direktor bei der Reichsbahn (Germany);

◆ M. **Bloch**, ingénieur en chef des services du matériel et des ateliers du Chemin de fer de Paris à Orléans;

E. C. **Cox**, C. B. E., traffic manager, Southern Railway (Great Britain);

G. H. **Crook**, assistant to signal engineer, Great Western Railway (Great Britain);

◆ E. **Dähnick**, Dezernent für Personenwagenbau im Reichsbahn-Zentralamt für Maschinenbau (Germany);

H. **Deyl**, conseiller ministériel et chef du département IV/5, Ministère des chemins de fer (Czechoslovakia);

◆ E. **D'Ocon Cortes**, ingénieur, sous-chef du service commercial du Chemin de fer de Madrid-Saragosse-Alicante (Spain);

◆ J. **Dolinar**, chef du service de la répartition du matériel des Chemins de fer de l'Etat (Jugoslavia);

H. **Eckert**, chef de section de la division de l'électrification des Chemins de fer fédéraux (Switzerland);

◆ **Mohamed Kamal El-Khishin** Bey, principal inspector of the Engineering Department, Egyptian State Railways;

◆ C. **Fettarappa**, ingénieur, inspecteur en chef au service de l'exploitation des Chemins de fer de l'Etat (Italy);

A. D. J. **Forster**, assistant commissioner, New South Wales Government Railways;

◆ Sir Henry **Fowler** (*), K. B. E., assistant to vice-president (Research and Development), London Midland & Scottish Railway (Member of the Permanent Commission);

O. **Gaeremynck,** ingénieur principal au service de exploitation de la Société Nationale des chemins de r belges (Belgium);

J. **Garcia Garin,** chef du service du matériel fixe es voies et travaux, Chemins de fer du Nord de Espagne (Spain);

H. N. **Gresley** (*), C. B. E., chief mechanical engin-er, London & North Eastern Railway (Member of ne Permanent Commission);

Hauterre, chef de l'exploitation adjoint des Chemins e fer de l'Etat (France);

Dr. E. **Huber-Stockar,** ingénieur-conseil des Che-ins de fer fédéraux (Switzerland);

L. **Jacobs,** directeur général adjoint de la Société ationale des chemins de fer vicinaux (Belgium);

F. **Jaehn,** Reichsbahnoberrat, Reichsbahn-Zentral-nt (Germany);

M. **Japiot,** ingénieur en chef adjoint du matériel de la traction des Chemins de fer de Paris à Lyon à la Méditerranée;

R. **Klatovsky,** ingénieur, conseiller ministériel, chef u département de la traction, Ministère des chemins e fer (Czechoslovakia);

Dr. S. **Kurokochi,** director of the Bureau of main-nance and improvement, Department of Railways, overnment of Japan;

E. **La Valle,** ingénieur, inspecteur en chef, direc-ur du bureau central du conseil technique près de inspectorat général des chemins de fer, tramways automobiles (Italy);

Leboucher, ingénieur en chef des services tech-iques du matériel et de la traction, Chemins de fer u Midi (France);

F. **Level,** directeur de la Compagnie générale de ies ferrées d'intérêt local (France);

R. **Mariani,** ingénieur, chef de service au service u matériel et de la traction, Chemins de fer de Etat (Italy);

Dr. S. **Matsunawa,** chief of the Railway Research ffice, Department of Railways, Government of apan;

E. **Mellini,** ingénieur, inspecteur supérieur de inspectorat général des chemins de fer, tramways automobiles (Italy);

D. **Mendizabal,** sous-directeur des Chemins de fer e Madrid-Saragosse-Alicante (Spain);

C. **Mereutza** (*), Ingénieur, inspecteur général, ous-directeur général des Chemins de fer de l'Etat Rumania) (Member of the Permanent Commission);

M. **Mermont,** inspecteur général du mouvement des hemins de fer de l'Est (France);

E. **Minsart** (*), ingénieur principal à la Société ationale des chemins de fer belges;

A. **Miszke,** ingénieur, chef du bureau des études et es projets au Ministère des communications (Poland);

M. A. **Newlands,** C. B. E., chief engineer, London idland & Scottish Railway;

G. **Panaitopol,** ingénieur, inspecteur général, direc-ur supérieur de la traction aux Chemins de fer de Etat (Rumania);

Mohamed Sobhi Ishak Effendi, Inspector and Secre-ry, Light Railways Commission (Egypt);

E. **Soulez,** ingénieur en chef attaché à la direc-on de l'exploitation du Chemin de fer du Nord rance);

◆W. **Stäckel,** Reichsbahndirektor und Mitglied der Hauptverwaltung der Deutschen Reichsbahn Gesell-schaft (Germany);

◆E. **Student,** Reichsbahndirektor und Mitglied der Hauptverwaltung der Deutschen Reichsbahn Gesell-schaft (Germany).

F. M. **Thomson,** district engineer, Missouri-Kansas-Texas Lines;

◆L. **Tosti,** ingénieur, inspecteur en chef supérieur au service du personnel et des affaires générales, Chemins de fer de l'Etat (Italy);

◆C. **Valeri,** ingénieur, inspecteur en chef supérieur au service du matériel et de la traction, Chemins de fer de l'Etat (Italy);

◆W. F. H. **van Rijckevorsel,** ingénieur, chef du service des transports des Chemins de fer néerlan-dais (Netherlands);

F. P. **Villamil,** chef de la division commerciale au Chemin de fer du Nord de l'Espagne (Spain);

◆V. **Vlaikoff,** ingénieur des signaux, Chemins de fer de l'Etat (Bulgaria);

S. **Withington,** electrical engineer, New York, New Haven & Hartford Railroad.

D. — PRINCIPAL SECRETARIES.

◆A. **Allard,** directeur à la Société Nationale belge des chemins de fer vicinaux (Belgium);

◆A. W. **Chantrell** (*);

◆G. L. A. **Duchateau,** ingénieur principal à la Société Nationale des chemins de fer belges (Belgium);

◆E. **Minsart** (*).

E. — SECTION SECRETARIES.

◆Prof. H. **Baumann** (*), Direktor bei der Reichs-bahn, Deutsche Reichsbahn Gesellschaft (Germany);

◆**Chaperon,** chef adjoint des services administratifs à la Compagnie du Chemin de fer du Nord (France);

◆E. **Dähnick** (*), Reichsbahnoberrat, Deutsche Reichsbahn Gesellschaft (Reporter) (Germany);

◆V. **Herwig,** Reichsbahnoberrat, Deutsche Reichsbahn Gesellschaft (Germany);

◆**Naguib** Effendi **Gobran,** tariff controller, Traffic Department of the Egyptian State Railways;

◆**Ahmed Rida Kamel** Effendi, technical controller, Ramleh Electric Tramways;

◆H. **Rousseau,** inspecteur principal-adjoint à la Com-pagnie du chemin de fer de Paris-Orléans (France);

◆**Salah-el-Dine** Effendi **Hamdy,** inspector, Traffic Department of the Egyptian State Railways;

◆L. **Santini,** ingénieur au service central du matériel et de la traction à la Compagnie des chemins de fer de Paris à Lyon et à la Méditerranée (France);

◆Dr. **Sayed** Effendi **Abdel Wahed,** Chief of the tech-nical office, Bridges Department of the Egyptian State Railways;

◆R. **Schutz,** ingénieur principal au service des études techniques du réseau d'Alsace et de Lorraine (France);

◆W. **Stäckel** (*), Reichsbahndirektor und Mitglied der Hauptverwaltung der Deutschen Reichsbahn Gesellschaft (Reporter) (Germany).

◆Dr. A. **Velleman.**

II. — Members appointed by adherent Governments and by affiliated Railway Administrations and Organisations.

A. — GOVERNMENTS AND THEIR DELEGATES.

Allemagne (Germany).

Reichsverkehrsministerium :

◆ F. **Besser** (*), Geheimer Baurat, Ministerialrat (member of the Permanent Commission);

Dr. G. **Hein**, Ministerialrat.

Belgique (Belgium).

Ministère des Transports :

J. **Castiau** (*), secrétaire général (member of the Permanent Commission);

◆ E. **Foulon** (*), directeur général de la Société Nationale des Chemins de fer belges (president of the Permanent Commission).

Bulgarie (Bulgaria).

Ministère des Chemins de fer, Postes et Télégraphes :

◆ L. **Bochkoff**, directeur général des Chemins de fer et des Ports;

◆ V. **Vlaikoff** (*), ingénieur de la section technique des Chemins de fer de l'Etat (Reporter).

Chine (China).

Ministry of Railways :

◆ Dr. C. C. **Wang**, Director of the Chinese Government Purchasing Commission.

Danemark (Denmark).

Ministère des Travaux publics :

◆ P. **Knutzen** (*), directeur général des Chemins de fer de l'Etat (member of the Permanent Commission);

◆ F. **Hoskiaer**, secrétaire général du Ministère des Travaux publics;

◆ C. V. **Jensen**, directeur au Contrôle des Chemins de fer privés.

Egypte (Egypt).

Ministry of Communications :

◆ H. E. **Ibrahim Fahmy Kerim** Pasha (*), Minister of Communications;

◆ H. E. **Mohamed Chafik** Pasha (*), Minister of Public Works;

◆ H. E. **Ahmed Abdel Wahab** Pasha (*), Under Secretary of State, Ministry of Finances;

◆ **Mahmoud Chaker** Bey (*), Under Secretary of State, Ministry of Communications;

◆ H. E. **Abdul Hamid Soliman** Pasha (*), former Minister, Senator;

◆ H. E. **Mahmoud Sedky** Pasha (*), Governor of Cairo.

Espagne (Spain).

Ministère des Travaux publics :

◆ M. **de la Torre Eguia**, ingénieur;

◆ M. **Aguilar Lopez**, ingénieur;

◆ **Torres Quevedo y Polanco**, ingénieur.

Finlande (Finland).

Ministère des Communications et des Travaux publics :

◆ J. **Castrén**, directeur général des Chemins de fer de l'Etat.

France, Protectorats et Colonies (France, Protectorates and Colonies).

A. — FRANCE.

Ministère des Travaux publics :

Grimpret (*), conseiller d'Etat, directeur général des Chemins de fer (member of the Permanent Commission);

de Pontevès, directeur du Contrôle du travail des agents de Chemins de fer;

Normandin, ingénieur en chef-adjoint au directeur du Contrôle de l'Exploitation technique du Matériel et de la Traction;

◆ **Betbeder-Matibet**, ingénieur en chef-adjoint au directeur du Contrôle des études et travaux des lignes nouvelles;

Ducomet, contrôleur général de l'Exploitation commerciale des Chemins de fer.

B. — PROTECTORATES AND COLONIES.

Tunis.

Direction Générale des Travaux publics :

Favière, directeur général.

Grande-Bretagne, Inde, Dominions, Protectorats et Colonies. (Great Britain, India, Dominions, Protectorates and Colonies).

A. — GREAT BRITAIN.

Ministry of Transport :

◆ E. W. **Rowntree**, C. B. E., assistant secretary, Ministry of Transport;

◆ Lt. Col. A. H. L. **Mount**, C. B., C. B. E., chief inspecting Officer of Railways, Ministry of Transport;

◆ G. H. **Selous**, O. B. E., commercial secretary at the Residency, Cairo.

B. — INDIA.

Railway Department (Railway Board) :

F. **D'Souza**, director of Traffic, Railway Board;
E. R. **Casement**, senior Government inspector of ilways;
E. B. **Robey**, officer of the Indian Railway Service Engineers and senior Government inspector of ilways.

Grèce (Greece).

Ministère des Communications :

G. **Bouyoukas**, directeur général des Chemins de fer Ministère des Communications.

Italie (Italy).

Ministère des Communications :

Prof. A. **Martelli**, député au Parlement;
Prof. S. **Panunzio**, député au Parlement;
G. **Salvini**, ingénieur, président du Collège national s Ingénieurs des Chemins de fer italiens
Dr. A. **Crispo**, inspecteur général des Chemins de , Tramways et Automobiles, au Ministère Royal des mmunications;
Prof. F. **Tajani**, titulaire de la chaire des Chemins fer à l'Ecole polytechnique de Milan;
F. **Pennavaria**, député au Parlement.

Japon (Japan).

Department of Railways :

Dr. Y. **Tanaka**, engineer, Railway Department;
T. **Fukukawa** (*), secretary, manager of the Berlin fice of the Japanese Government Railways (mem- of the Permanent Commission);
S. **Miwa**, secretary;
S. **Ohshima**, engineer;
S. **Taga**, engineer;
K. **Kajiura**, engineer.

Norvège (Norway).

Ministère des Travaux publics :

O. **Aubert**, directeur à l'Administration des Che- ns de fer de l'Etat.

Pays-Bas et Colonies (Netherlands and Colonies).

Ministère du Waterstaat :

Th. M. B. **van Marle** (*), ingénieur, inspecteur géné- des Chemins de fer et des tramways (member of e Permanent Commission);
H. J. **van Braambeek**.

Pologne (Poland).

Ministère des Communications :

W. **Czapski**, ingénieur, sous-secrétaire d'Etat au nistère des Communications.

Portugal.

Ministère du Commerce et des Communications :

◆ A. **de Souza Rego**, directeur général, Direction générale des Chemins de fer;
◆ C. **Pinto Machado**, membre de la Direction générale des Chemins de fer;
◆ J. **Fernando de Sousa**, membre du Conseil supérieur des Chemins de fer;
◆ P. **Monteiro de Barros**, membre du Conseil supérieur des Chemins de fer;
◆ R. S. **do Vale Monteiro**, ingénieur.

Roumanie (Rumania).

Ministère des Chemins de fer :

◆ A. **Teodoreano**, ingénieur;
J. **Miclesco**, ingénieur.

Suède (Sweden).

Ministère de l'Intérieur :

A. M. **Granholm** (*), directeur général des Chemins de fer de l'Etat (member of the Permanent Commission);

Ministère des Affaires Etrangères :

◆ H. E. Baron H. **de Bildt**, Ministre de Suède en Egypte;
◆ E. **Ekberg**, vice-consul de Suède en Egypte.

Suisse (Switzerland).

Département fédéral des Postes et des Chemins de fer :

◆ H. **Hunziker** (*), ingénieur, directeur de la Division des Chemins de fer (member of the Permanent Commission).

Tchécoslovaquie (Czechoslovakia).

Ministère des Chemins de fer :

◆ V. **Ibl**, ingénieur, directeur des services routiers au Ministère des chemins de fer.

Yougoslavie (Royaume de) Jugoslavia (Kingdom of)

Ministère des Communications :

◆ M. **Yoyitch**, ingénieur, directeur-adjoint des Chemins de fer de l'Etat.

B. — **DELEGATES OF THE AFFILIATED RAILWAY ADMINISTRATIONS.**

Allemagne (Germany).

Deutsche Reichsbahn-Gesellschaft :

◆ Dr. Ing. J. **Dorpmüller** (*), Generaldirektor (member of the Permanent Commission);
◆ P. **Wolf** (*), Geheimrat, Direktor (member of the Permanent Commission);

◆ Prof. H. **Baumann** (*), Direktor bei der Reichsbahn (reporter and section secretary);
◆ E. **Dähnick** (*), Reichsbahnoberrat (reporter);
◆ V. **Herwig** (*), Reichsbahnoberrat (section secretary);
◆ W. **Stäckel** (*), Reichsbahndirektor (reporter and section secretary);
◆ E. **Student** (*), Reichsbahndirektor (reporter);
◆ H. **Hamel**, Reichsbahnoberamtmann.

Argentine.

Buenos Ayres Great Southern Railway :

Sir Eastman **Bell**, Bart., director;
Hon. Eric B. **Butler-Henderson**, director;
J. M. **Eddy**, C. B. E., director;
Sir Sam **Fay**, director;
N. F. E. **Grey**, assistant secretary;
Lt. Col. R. T. **Harper**, O. B. E., F. C. A., secretary;
Sir Brodie **Henderson**, K. C. M. G., C. B., consulting engineer;
F. **Holt**, director;
Lt. Col. W. **Parish**, C. M. G., C. B. E., director.

Entre Rios Railways :

J. **Williamson**, director;
W. J. **George**, secretary;
◆ L. C. **Meeking**, Stores official.

Chemin de fer de Rosario à Puerto Belgrano :

◆ P. **Chapuy**, président du Conseil d'administration;
G. **Hersent**, administrateur;
J. **Lovenbach**, administrateur.

Chemins de fer de la province de Santa Fé :

A. **Benac**, administrateur;
◆ J. **Boissonnas**, administrateur;
◆ H. **Puerari**, administrateur.

Autriche (Austria).

Chemins de fer Fédéraux autrichiens :

◆ Dr.-Ing. E. **Seefehlner** (*), Generaldirektor (member of the Permanent Commission);
◆ Dr. O. **Steyrer**, Ministerialrat, leitender Direktor des Österreichischen Verkerhsbureaus.

Belgique et Colonie (Belgium and Colony).

A. — BELGIUM.

Société Nationale des Chemins de fer belges :

◆ E. **Foulon** (*), directeur général (president of the Permanent Commission);
◆ A. **Jacques** (*), directeur du Service de la Voie (member of the Permanent Commission);
◆ **Henning**, inspecteur en chef-adjoint au directeur de l'Exploitation;
◆ **Duquesne**, ingénieur principal au Service du Matériel;
◆ O. **Gaeremynck** (*), ingénieur principal au Service de l'Exploitation (reporter);
◆ **Lemaire**, inspecteur technique principal du Service des Finances;
◆ **Vandersypen**, ingénieur principal à l'Atelier Central de Malines;
◆ **Decroo**, représentant commercial.

Chemin de fer de Chimay :

◆ P. **Wauwermans**, administrateur.

Chemin de fer de Malines à Terneuzen :

A. **Verwilghen** (Baron), administrateur, membre du Comité de Direction.

Chemin de fer Nord-Belge :

◆ A. **de Spirlet**, ingénieur de la voie.

Société Nationale des Chemins de fer vicinaux :

◆ E. **Gevaert**, administrateur;
◆ L. **Jacobs** (*), directeur général adjoint (reporter)
◆ A. **Allard** (*), directeur (principal secretary).

Compagnie générale d'entreprises électriques et industrielles « Electrobel » :

◆ G. **Crombé**, administrateur.

Railways Economiques de Liége-Seraing et extensions :

◆ R. **Haerens**, administrateur.

B. — COLONY.

Chemin de fer du Bas-Congo au Katanga :

◆ L. **Jadot**, administrateur délégué;
◆ P. **Gillet**, directeur;
◆ J. **Callens**, secrétaire de direction.

Chemin de fer du Congo :

A. **Marchal**, vice-président et directeur général.

Chemins de fer vicinaux du Congo :

◆ A. **Lienart**, administrateur-directeur.

Brésil (Brazil).

Chemins de fer de l'Est Brésilien :

V. **Vee**, administrateur;
A. **Lazard**, administrateur;
L. **Beck**, ingénieur, chef des Services.

Great Western of Brazil Railway :

◆ W. M. **Codrington**, director;
◆ J. M. **Graham**, assistant accountant.

Bulgarie (Bulgaria).

Chemins de fer de l'Etat Bulgare :

◆ L. **Bochkoff** (*), directeur général (also delegate by the Bulgarian Government);
◆ V. **Vlaikoff** (*), ingénieur des signaux (also delegated by the Bulgarian Government, and reporter).

Chili (Chile).

Nitrate Railways :

W. S. **Eyre**, director.

Chine (China).

Compagnie Générale de Chemins de fer et de Tramways en Chine :

A. **Bégault**, ingénieur.

Colombie (Columbia).

Société Nationale de Chemins de fer en Colombie :

J. **Ortmans**, administrateur.

The Colombia Railways and Navigation Company:

Sir Stephen H. M. **Killik**, chairman of the Board of irectors.

Danemark (Denmark).

Chemins de fer de l'Etat danois :

O. H. **Münck**, directeur du Matériel et de la Trac-on;

H. **Flensborg**, directeur de la Voie et des Bâtiments.

Chemin de fer de la Fionie Méridionale :

S. **Neumann**, préfet de la Fionie, chef de la direc-on;

J. P. **Stensballe**, membre de la direction, membre u Sénat, ancien Ministre des Communications et du ommerce.

Chemin de fer de Lolland-Falster :

F. **Agerskov**, directeur.

Egypte (Egypt).

State Railways :

R. E. **Thomas** (*), deputy general manager (mem-r of the Egyptian Local Organising Commission);

Mustapha Hamdi El Kattan Bey (*), chief engineer, ay and works (member of the Egyptian Local ganising Commission);

J. W. **Macaldin** (*), deputy chief engineer, way and orks (member of the Egyptian Local Organising ommission);

C. E. **Blyth** (*), chief mechanical engineer (member the Egyptian Local Organising Commission);

Abdel Rahman Hamada Bey (*), deputy chief echanical engineer (member of the Egyptian Local ganising Commission);

P. W. **Weaver** (*), traffic manager (member of the yptian Local Organising Commission);

Zaki Fahmy Bey (*), deputy traffic manager (mem-r of the Egyptian Local Organising Commission).

Espagne (Spain).

Chemins de fer Andalous :

J. **de Arteaga y Echagüe**, président du Conseil d'Ad-nistration;

V. **Montal Cornelles**, président de la Commission Exécutive;

J. **Compte y Villadomat**, administrateur;

A. **de Albuquerque**, administrateur et secrétaire général;

J. L. **Coello de Portugal**, Comisario del Estado.

Chemin de fer Central de Aragon :

◆ Marquis **de Urquijo**, vice-président du Conseil d'Administration;

◆ Comte **de Sierragorda**, administrateur-secrétaire.

Ferrocarril Cantabrico :

◆ **E. Botin y Saenz de Santuola**, membre du Conseil d'Administration.

Chemins de fer Catalans :

O. **Lagasse**, administrateur-directeur;

D. T. **Garcia Diego**, ingénieur des Ponts et Chaussées.

Chemins de fer de Madrid-Saragosse-Alicante :

E. **Maristany** (*), Marquis d'Argentera, directeur général (member of the Permanent Commission);

A. **Valenciano** (*), administrateur (member of the Permanent Commission);

◆ D. **Mendizabal** (*), sous-directeur (reporter);

◆ E. **d'Ocon Cortes** (*), sous-chef du Service Commercial (reporter);

A. **Hernandez Bayarri**, administrateur;

C. **Maristany**, administrateur;

E. **Alfonso**, directeur-adjoint;

M. M. **Arrillaga**, sous-directeur;

J. **Nogues**, ingénieur en chef à la direction;

T. **Tamarit**, ingénieur en chef-adjoint de la Voie;

M. **Bustinduy**, ingénieur en chef-adjoint du Matériel et de la Traction;

A. **Gibert**, ingénieur en chef du Service électrique.

Chemins de fer du Nord de l'Espagne :

Marquis **de Alonso Martinez**, président;

◆ J. A. **Bravo y Diaz Cañedo**, administrateur;

◆ E. **Grasset**, sous-directeur;

A. R. **Flobert**, ingénieur en chef du Matériel et de la Traction;

◆ F. **Reparaz**, chef du Service d'Etudes;

◆ Vicomte **de Escoriaza**, vice-président du Conseil d'Administration;

D. **de Epalza**, administrateur.

Compagnie Nationale des Chemins de fer de l'Ouest de l'Espagne :

E. **Pan y Pérez**, ingénieur en chef des Ponts et Chaussées, président du Conseil d'Administration;

A. **Forcat**, directeur général du Trésor et administrateur;

J. M. **de Escoriaza**, ingénieur, professeur à l'Ecole d'Ingénieurs Agronomes, administrateur;

A. **Krahe**, ingénieur des Ponts et Chaussées, directeur-adjoint;

V. **Rivera**, ingénieur des Ponts et Chaussées, ingénieur en chef attaché à la Direction.

Great Southern of Spain Railway :

◆ G. **Boag**, general manager.

Mines et Chemins de fer de Utrillas :

S. **Baselga Ramirez**, directeur-gérant.

Etats-Unis d'Amérique (United States of America).

Bessemer and Lake Erie Railroad :

◆ H. R. **White**.

Erie Railroad :

◆ E. **Wagner**.

Pennsylvania Railroad :

◆ H. B. **Bovee**, European freight agent.

Finlande (Finland).

Chemins de fer de l'Etat :

◆ J. **Castrén** (*), directeur général (also delegated by the Finnish Government);

◆ K. H. **Petterson**, directeur-adjoint;

◆ J. **Roiha**, 1er ingénieur de la ligne.

France, Protectorats et Colonies (France, Protectorates and Colonies).

A. — FRANCE.

Chemins de fer de l'Etat :

◆ **Direz**, chef de l'Exploitation;

◆ **Hauterre** (*), chef de l'Exploitation adjoint (reporter).

Chemins de fer d'Alsace et de Lorraine :

◆ G. **Dayras**, membre du Conseil de Réseau, maître des Requêtes au Conseil d'Etat;

◆ **Regnauld**, ingénieur en chef du Matériel et de la Traction.

Chemins de fer de l'Est :

◆ L. **Marlio**, vice-président du Conseil d'Administration;

◆ R. **Fabry**, administrateur;

◆ J. B. **Mermont** (*), inspecteur général du Mouvement (reporter);

◆ E. **Duchatel**, ingénieur en chef du Matériel et de la Traction.

Chemins de fer du Midi :

Tirard, président du Conseil d'Administration;

◆ **Teissier**, président honoraire du Conseil d'Administration;

Gufflet, directeur;

◆ **Paul** (*), directeur général honoraire (member of the Permanent Commission);

Bachellery, ingénieur en chef du Matériel et de la Traction;

◆ **Bouteloup**, ingénieur en chef de la voie;

Petetin, ingénieur principal attaché à la direction;

Berveiller, secrétaire général administratif;

◆ **Leboucher** (*), ingénieur en chef des Services techniques du Matériel et de la Traction (reporter).

Chemins de fer du Nord :

M. **de Waru**, vice-président;

◆ F. **Tettelin**, ingénieur en chef des Travaux et de la Surveillance;

◆ **Chaperon** (*), chef-adjoint des Services administratifs (section secretary).

Chemins de fer de Paris à Orléans :

◆ M. **Bloch** (*), ingénieur en chef des Services du Matériel et des Ateliers (reporter);

◆ E. **Bonnet**, administrateur;

◆ L. **de Boysson**, sous-directeur;

◆ H. **Rousseau** (*), inspecteur principal-adjoint (section secretary).

Chemins de fer de Paris à Lyon et à la Méditerranée :

◆ G. **Cordier**, président honoraire du Conseil d'Administration;

◆ A. **Silhol**, vice-président du Conseil d'Administration;

◆ M. **Margot** (*), directeur général (member of the Permanent Commission);

◆ **Renevey**, directeur de l'Office Central d'Etudes du Matériel de Chemin de fer;

◆ **Vallantin**, ingénieur en chef du Service du Matériel et de la Traction;

◆ **Japiot** (*), ingénieur en chef-adjoint du Service du Matériel et de la Traction (reporter);

◆ **Santini** (*), ingénieur au Service Central du Matériel et de la Traction (section secretary).

Société Générale des Chemins de fer Economiques :

J. **Joubert**, président du Conseil d'Administration;

F. **Berthelier**, vice-président;

M. **Auriol**, administrateur;

A. **Delille**, directeur;

J. **Grignon**, sous-directeur;

G. **de Chevigné**, secrétaire de la direction.

Chemins de fer Economiques du Nord :

◆ G. **Mullet**, administrateur.

Chemins de fer de l'Est de Lyon :

◆ M. **Cahen**, administrateur-délégué.

Chemins de fer secondaires du Nord-Est :

◆ P. **Jourdain**, administrateur-délégué;

◆ F. **Jourdain**, secrétaire du Comité de Direction.

Chemin de fer de Somain à Anzin et à la frontière belge :

◆ **Sommier**, administrateur.

Chemins de fer de la Provence :

A. **Just**, administrateur.

Compagnie Générale des Chemins de fer vicinaux:

◆M. **Bouteau**, administrateur.

Compagnie Générale de Voies Ferrées d'intérêt local :

◆F. **Level** (*), directeur (reporter);

G. **Crépin**, secrétaire de la direction;

◆R. **Périn**, inspecteur principal du Matériel et de la Traction.

Régie Départementale des Tramways de l'Ain :

G. **Loiseau**, administrateur;

◆L. **Mallez**, administrateur-directeur.

Compagnie des Tramways de l'Indre :

E. **Seydoux**, président.

B. — PROTECTORATES AND COLONIES.

Chemins de fer Algériens de la Compagnie Paris-Lyon-Méditerranée :

◆**Vagnon**, membre du Conseil Supérieur des Chemins de fer algériens d'intérêt local.

Chemin de fer de Gafsa :

◆M. **Pellé**, vice-président, administrateur-délégué.

Compagnie fermière des Chemins de fer Tunisiens :

◆P. **Masure**, secrétaire général.

Chemins de fer Coloniaux de l'Afrique Occidentale française :

◆P. J. C. **Jacquinot**, ingénieur en chef des Travaux publics des Colonies.

Chemin de fer de Dakar à St-Louis :

L. **Lorieux**, administrateur;

M. **Lacheze**, ingénieur-conseil;

P. **Larcher**, attaché à la direction.

Chemins de fer du Maroc :

A. **Guerin**, directeur général;

L. **Philippe**, directeur de la Construction;

P. **Ardoin**, directeur de l'Exploitation.

Chemin de fer de Damas-Hamah et prolongements :

P. **Blanche**, administrateur-délégué;

L. **Nidelet**, directeur de l'Exploitation.

Chemins de fer Coloniaux de l'Indochine :

Camus, ingénieur des Ponts et Chaussées.

Compagnie française des Chemins de fer de l'Indochine et du Yunnan :

R. **Brouillet**, administrateur.

Chemin de fer du port et de la Pointe des Galets (Réunion Island) :

P. J. C. **Jacquinot** (*), ingénieur en chef des Travaux publics des Colonies (also delegated by the « Chemins de fer Coloniaux de l'Afrique Occidentale française »).

Grande-Bretagne, Nord de l'Irlande, Inde, Dominions, Protectorats et Colonies. (Great-Britain, Northern Ireland, India, Dominions, Protectorates and Colonies).

A. — GREAT BRITAIN AND NORTHERN IRELAND.

London Midland and Scottish Railway :

◆D. **Vickers** (*), director (member of the Permanent Commission);

◆Sir Henry **Fowler** (*), K. B. E., assistant to vice-president, Research and Development (member of the Permanent Commission and reporter);

◆E. J. H. **Lemon**, assistant to vice-president;

◆M. A. **Newlands** (*), chief civil engineer (reporter);

◆D. R. **Lamb**, observer;

◆Miss F. **Newlands**, secretary to chief engineer.

London and North Eastern Railway :

◆H. N. **Gresley** (*), chief mechanical engineer (member of the Permanent Commission and reporter).

Southern Railway :

◆The Right Hon. Sir Evelyn **Cecil** (*), G. B. E., privy councillor, director (member of the Permanent Commission);

◆Sir Francis H. **Dent** (*), C. V. O., director (member of the Permanent Commission).

Great Northern Railway of Ireland :

◆R. A. **Gradwell**, director;

Lt. Col. J. C. W. **Madden**, director.

B. — INDE, DOMINIONS, PROTECTORATES AND COLONIES.

South African Railways and Harbours :

◆T. C. **Swallow**, advisory engineer.

Sudan Railways :

◆A. J. **Matthew**, assistant general manager;

◆H. D. **Bindley**, assistant chief engineer;

◆G. K. **Wood**, district locomotive superintendent.

New Zealand Government Railways :

◆R. J. **Harvey** (*), consulting engineer to the Government of New Zealand (member of the Permanent Commission).

Ceylon Government Railway :

◆Sir D. B. **Jayatilaka**, minister for Home Affairs and leader of the State Council of Ceylon;

◆O. E. **Goonetilleke**, auditor general.

Bengal and North Western Railway :

Sir Henry P. **Burt**, K. C. I. E., C. B. E., chairman (also delegated by the Rohilkund and Kumaon Railway);

Lt. Col. T. R. E. **Gracey**, director.

Bombay, Baroda and Central India Railway :

◆Sir John S. **Wardlaw-Milne**, director;

◆S. G. S. **Young**, secretary.

Burma Railways :

J. R. D. **Glascott**, agent;
◆G. J. B. **Bevan**, district engineer;
K. J. R. **Smith**, assistant engineer;
R. T. **Power**, deputy traffic manager;
W. **McCabe**, assistant engineer;
◆O. H. **Glanville**, assistant traffic superintendent;
◆R. D. **Cant**, assistant engineer;
◆W. H. **Chance**, deputy agent.

Eastern Bengal Railway (State Railway of India) :

B. R. **Singh**, chief engineer;
V. S. **Koland**, assistant superintendent;
◆A. E. B. **Sullen**, superintending engineer;
N. D. **Calder**, deputy traffic manager;
R. C. **Paranjoti**, assistant locomotive superintendent.

East Indian Railway (State Railway of India) :

◆N. A. **Shove**, superintendent, Power;
◆H. **Gatford**, senior superintendent, Way and Works;
◆J. C. **Gibson**, Works manager, Carriage and Wagon Shops;
R. L. **Tanner**, production engineer.

Great Indian Peninsula Railway (State Railway of India) :

N. L. **Inkson**, divisional transportation superintendent;
◆R. S. **Moberly**, divisional traffic manager;
◆W. B. **Burford**, superintendent of statistics;
◆E. L. **Ensor**, assistant transportation superintendent (telegraphs);
S. S. **Vasist**, assistant transportation superintendent;
◆W. G. **Alcock**, personal assistant to the chief mechanical engineer.

Madras and Southern Mahratta Railway :

◆Sir Francis D. **Couchman**, K. B. E., M. I. C. E., director;
◆H. **Lingard**, M. I. C. E., chief engineer;
◆M. A. **Walker**, B. A., M. I. L. E., deputy transportation superintendent.

North Western Railway (State Railway of India) :

C. A. H. **Edwards**, deputy chief engineer;
◆W. O. **Chalk**, divisional rolling stock officer;
◆C. E. **Spurgeon**, chief mechanical engineer;
F. G. **Griffith**, divisional transportation officer;
◆G. W. P. **Avery**, divisional transportation officer;
◆J. **Vardon**, executive engineer (tube boring).

Rohilkund and Kumaon Railway :

Sir Henry P. **Burt** (*), K. C. I. E., C. B. E., chairman (also delegate of the Bengal and North Western Railway).

Federated Malay States Railways :

J. O. **Sanders**, agent, traffic manager;
◆H. M. **le Fleming**, assistant locomotive superintendent.

Iraq State Railways :

◆Col. J. R. **Tainsh**, C. B. E., V. D., general manager;
◆N. P. O'R. **Blackwood**, M. B. E., traffic manager;
F. R. **Lewis**, electrical engineer.

Grèce (Greece).

Chemins de fer de l'Etat hellénique :

◆B. **Leondopoulos**, secrétaire général.

Chemins de fer Pirée-Athènes-Péloponèse :

G. **Doumas**, directeur général;
◆J. **Petridis**, administrateur-délégué;
G. **Zissimatos**, directeur du Service de la Traction et du Matériel.

Hongrie (Hungary).

Chemins de fer Royaux de l'Etat hongrois :

◆E. **Lajthay**, ingénieur principal.

Irlande (Etat libre d') (Irish Free State).

Great Southern Railways :

The Rt. Hon. J. **MacMahon**, director;
Dr. W. L. **Murphy**, director;
◆J. X. **Murphy**, director.

Italie (Italy).

Chemins de fer de l'Etat italien :

◆Gr. Uff. Ing. G. B., **Chiossi**, vice direttore generale;
◆Gr. Uff. Avv. G. **Falcone**, capo del servizio personale e affari generali;
◆A. **Faccarini**;
◆Comm. Ing. Dott. G. **Forte**, capo servizio-capo della sezione ferroviaria del Regio Istituto Sperimentale delle Comunicazioni, Roma;
Comm. Ing. A. **Radius**, ispettore capo superiore servizio Movimento, Roma;
◆F. **Farne**, ispettore de 1ª classe;
Comm. Ing. N. **Giovene**, ispettore capo superiore servizio personale e affari generali, Roma;
◆Comm. Ing. C. **de Benedetti**, ispettore capo superiore servizio Lavori e Costruzioni, Roma;
Comm. Ing. G. C. **Palmieri**, ispettore capo superiore servizio Movimento, Roma;
◆Comm. Ing. R. **Romero**, ispettore capo, servizio Materiale e Trazione, Firenze;
◆Comm. Ing. C. **Carli**, ispettore capo, servizio Materiale e Trazione, Firenze;
◆M.-A. **Gordini**, ispettore principale;
Cav. Uff. Ing. C. **del Guerra**, ispettore principale servizio Materiale e Trazione, Firenze;
◆Cav. Uff. Ing. M. **de Cornè**, ispettore principale, servizio Commerciale e del Traffico, Roma.

Chemins de fer de l'Apennin Central :

C. **Anghileri**, président, administrateur-délégué.

Tramways électriques de Brescia :
Bauer.

Chemin de fer Central et Tramways du Canavèse :
Gr. Uff. D. **Giachetti**, presidente.

Chemin de fer Circumetnea :
M. **Crimi**, consulente.

Società Trazione Elettrica Lombarda :
F. **Rossi**, ingénieur-conseil.

Tramways de Lombardie et Romagnes :
L. **Ottone**, avocat-conseil.

Chemins de fer de la Méditerranée :
C. **Feltrinelli**, président;
C. **Nagel**, conseiller technique.

Société Nationale de Chemins de fer et de Tramways :
L. **Ottone** (*), avocat-conseil (also delegated by Tramways de Lombardie et Romagnes);
Comm. E. **Parisi**, président.

Chemins de fer du Nord de Milan :
Dr. Ing. C. **Fortichiari**, ingénieur en chef de la Traction et du Matériel;
M. **Vanni**, ingénieur.

Chemins de fer Reggio-Emilia :
C. **Fiocchi**, consulente.

Ferrovie del Sud-Est :
Comte, Comm. U. **Pasquini**, administrateur-délégué;
Cav. Ing. G. **Fiastri**, directeur des services.

Chemins de fer complémentaires de la Sardaigne :
G. **Luzzatti**, conseiller d'administration;
G. **Menada**, conseiller d'administration.

Chemin de fer Suzzara-Ferrara :
G. **Belardini**, ingegnere, direttore.

Société turinoise de tramways et de chemins de fer économiques :
Gr. Uff. G. **Salvadori di Wiesenkoff**, président.

Tramways Vercellesi :
A. **Bocca**, conseiller d'administration.

Japon (Japan).

Japanese Government Railways :
Dr. Y. **Tanaka** (*), engineer, Railway Department (also delegated by the Government of Chosen, Railway Bureau, and by the Japanese Government);
T. **Fukukawa** (*), Manager of the Berlin Office of the Japanese Government Railways (member of the Permanent Commission and also delegated by the Japanese Government);
S. **Miwa** (*), secretary, Railway Department (also delegated by the Japanese Government);
S. **Ohshima** (*), engineer, Railway Department (also delegated by the Japanese Government);
◆K. **Kajiura** (*), engineer, Railway Department (also delegated by the Japanese Government);
◆S. **Taga** (*), engineer, Railway Department (also delegated by the Japanese Government);

Government General of Chosen, Railway Bureau :
◆Dr. Y. **Tanaka** (*), engineer, Railway Department (also delegated by the Japanese Government Railways);
◆Y. Ezaki, engineer.

Luxembourg (Luxemburg).

Chemins de fer Guillaume-Luxembourg :
◆F. **Colbert**, inspecteur principal de l'exploitation.

Norvège (Norway).

Chemins de fer de l'Etat :
◆O. **Aubert** (*), directeur des Voies et Travaux (also delegated by the Norwegian Government).

Pays-Bas et Colonies (Netherlands and Colonies).

A. — CONTINENT.

Chemins de fer Néerlandais (Compagnie pour l'exploitation des chemins de fer de l'Etat néerlandais and Compagnie du chemin de fer hollandais) :

Dr. H. **van Manen** (*), directeur (member of the Permanent Commission);
◆H. E. **Hoekstra**, ingénieur en chef, chef du Service de la Traction;
◆W. F. H. **van Rijckevorsel** (*), ingénieur, chef du service des Transports (reporter);
◆Ch. H. J. **Driessen**, ingénieur en chef, chef du service de la Voie et des Travaux.

B. — COLONIES.

Chemins de fer de l'Etat aux Indes néerlandaises :
◆S. **van Braam**, ingénieur;
◆P. F. **Binkhorst**, ingénieur.

Pologne (Poland).

Chemins de fer de l'Etat polonais :

M. **Gronowski**, ingénieur, directeur de département au Ministère des Communications;
◆A. **Wasiutynski**, ingénieur, Professeur à l'Ecole polytechnique de Varsovie, vice-président du conseil technique au Ministère des Communications;
◆J. **Wagner**, ingénieur, chef de section au Ministère des Communications;
◆A. **Tuz**, ingénieur, chef de section au Ministère des Communications;
◆A. **Miszke** (*), ingénieur, professeur à l'Ecole polytechnique de Varsovie, chef du bureau des Etudes et projets (reporter);
◆J. **Berkiewicz**, ingénieur, membre du conseil technique au Ministère des Communications;

◆H. **Jezierski** (*), ingénieur, conseiller ministériel au Ministère des Communications (member of the Permanent Commission);

◆A. **Virion**, ingénieur, sous-chef du bureau des études et projets;

◆A. **Wagner**, ingénieur, conseiller au Ministère des Communications;

Portugal and Colonies.

A. — CONTINENT.

Compagnie des Chemins de fer portugais :

◆R. **Esteves**, administrateur;

◆M. **Costa**, administrateur;

◆A. **de Lima Henriques**, sous-directeur;

◆A. Vicente **Ferreira**, ingénieur, chef de division-adjoint à la direction générale;

◆A. **de Campos Henriques**, ingénieur, chef-adjoint de la division de la Voie et des Travaux;

◆M. **de Paiva Couceiro**, ingénieur, sous-chef du service du Matériel et de la Traction.

Compagnie Nationale des Chemins de fer portugais :

◆P. J. **Diniz**, président du conseil;

◆P. F.**de Brion**, administrateur.

Chemins de fer portugais de la Beira-Alta :

◆J. **Abranches**, ingénieur, inspecteur général;

Companhia portuguesa para a construção e exploração de caminhos de ferro, Linhas do Vale do Vouga :

◆T. **Ferreira d'Almeida**, ingénieur, directeur de l'Exploitation.

B. — COLONIES.

Chemins de fer de l'Etat dans les Colonies portugaises :

◆A. A. **Lisboa de Lima**, colonel du Génie, ancien Ministre des Colonies, sous-directeur général au Ministère des Colonies, membre du Conseil technique des Travaux publics, Chemins de fer et Mines des Colonies, ancien directeur des Chemins de fer des Colonies;

◆A. **Cancela de Abreu**, ingénieur civil, sous-directeur du Chemin de fer Lisbonne-Cascaes, chef du Cabinet de S. E. M. le Ministre du Commerce et de l'Agriculture;

◆A. **Teixeira de Queroz Botelho de Castro e Vasconcelos**, ingénieur, sous-directeur des Chemins de fer au Ministère des Travaux publics et Communications;

◆C. M. **Torres**, ingénieur de la Direction Générale des Chemins de fer au Ministère des Travaux publics et Communications;

Chemins de fer du Benguela :

◆R. V. **Ramalho**, ingénieur.

Port et Chemins de fer de Lourenço Marquès :

Maj. F. **Pinto Teixeira**, directeur général;

Cap. **Mendes**, chef de l'Exploitation.

Roumanie (Rumania).

Chemins de fer Roumains :

M. **Jonesco**, directeur général;

C. **Mereutza** (*), sous-directeur général (member of the Permanent Commission and reporter);

◆J. **Hossu**, sous-directeur général;

◆G. **Panaitopol** (*), directeur supérieur de la Traction (reporter);

N. **Codreano**, directeur supérieur;

◆J. **Apostolesco**, sous-directeur;

◆T. **Bals**, ingénieur, inspecteur général.

Suède (Sweden).

Chemin de fer de Blekinge Kustbanor :

◆S. **de Hagströmer**, gouverneur de la province de Blekinge;

◆S. **Holmgren**, directeur en chef.

Chemin de fer Helsingborg-Hessleholms :

Baron A. **Thott**, directeur en chef.

Chemin de fer Kalmar-Nya :

J. **Zetterstedt**, juge au tribunal de première instance vice-président de la direction de la Compagnie.

Chemin de fer Nordmarks-Klarelfvens :

K. A. **Pallin**, chef de l'exploitation.

Chemin de fer Norra-Oestergötland :

Comm. E. M. **Lindgren**, directeur en chef.

Chemin de fer Stockholm-Roslag :

A. **Nerell**, general manager.

Chemin de fer Västergötland-Göteborg :

◆Col. J. **Nyström**, general and traffic manager;

◆O. **Carlander**, directeur.

Suisse (Switzerland).

Chemins de fer Fédéraux :

A. **Schrafl** (*), président à la direction générale (member of the Permanent Commission);

◆E. **Savary**, directeur du 1er arrondissement;

◆E. **Labhardt**, directeur du 2e arrondissement;

◆A. **Acatos**, ingénieur en chef de la division des travaux de la direction générale;

◆Dr. E. **Huber-Stockar** (*), conseiller technique de la direction générale (reporter).

Chemin de fer de Viège à Zermatt :

◆A. **Marguerat** (*), directeur (member of the Permanent Commission).

Chemin de fer Rhétique :

◆G. **Bener**, directeur;

◆H. **Conrad**, directeur-adjoint.

Chemin de fer de Lausanne à Ouchy :

◆G. **Nicole**, président du conseil d'administration.

Tchécoslovaquie (Czechoslovakia).

Chemins de fer de l'Etat :

J. **Hondl,** docteur en droit, conseiller ministériel et ief du département I/4 au Ministère des Chemins e fer;

O. **Hendrich,** ingénieur, conseiller ministériel et ief de département au Ministère des Chemins de fer;

B. **Reynek,** ingénieur, conseiller de section principal u Ministère des Chemins de fer;

J. **Gregor,** docteur en droit, commissaire principal u Ministère des Chemins de fer.

Turquie (Turkey).

Chemins de fer de l'Etat :

O. **Tevfik Fazli**, directeur du département de la raction;

A. **Irfan,** sous-directeur du département de la Voie.

Chemins de fer Smyrne-Cassaba et prolongement :

J. P. **Monod,** vice-président du Conseil d'administation;

L. **Chenut,** administrateur;

Naci Bey, adjoint à la direction de l'exploitation.

Chemins de fer Bozanti-Alep-Nissibine et prolongements :

R. **Jourde,** président du conseil d'administration;

E. **Grey,** secrétaire général;

M. **Audouin,** directeur de l'exploitation.

Uruguay.

Central Uruguay Railway of Montevideo :

F. **Henderson,** chairman;

G. R. **Cable,** director;

H. O. **Tubby,** secretary.

Yougoslavie (Jugoslavia).

Chemins de fer de l'Etat :

M. **Yoyitch** (*), ingénieur, directeur-adjoint (also elegated by the Jugoslav Government);

V. **Stehlik**, ingénieur, chef de la section de l'entreen de la Voie;

J. **Dolinar** (*), chef de la section de l'échange du atériel roulant (reporter).

— DELEGATES OF ASSOCIATIONS AFFILIATED TO THE INTERNATIONAL RAILWAY CONGRESS ASSOCIATION.

American Railway Association :

H. J. **Forster,** secretary.

Comité Permanent des transports par voie ferrée de la Société des Nations :

◆J. L. **Metternich,** secrétaire du comité permanent, membre de section du Secrétariat de la Société des Nations.

Compagnie Auxiliaire Internationale de Chemins de fer :

◆V. C. **Caspers,** directeur.

Compagnie Internationale des Wagons-Lits et des Grands Express Européens :

Baron R. **Snoy,** administrateur, directeur général;

◆R. **Margot-Noblemaire,** directeur général-adjoint;

◆F. **Woytt,** ingénieur en chef des services techniques;

O. **Viglione,** directeur pour l'Italie.

Confederazione Nazionale Fascista dei Trasporti Terrestri e della Navigazione Interna :

Prof. R. **Trevisani,** secrétaire général;

◆Gr. Off. G. **Ottone,** ingénieur;

Comm. L. **Giupponi,** ingénieur;

Comm. M. **Semenza,** ingénieur;

◆Doct. G. B. **Sirletti,** ingénieur;

◆Comm. Doct. P. **Lo Balbo.**

Premier Groupement régional des Chemins de fer Européens membres de l'Union Internationale des Chemins de fer (G. R. E. M.) :

◆V. **Ibl** (*), ingénieur, directeur des services routiers des Chemins de fer de l'Etat tchécoslovaque, secrétaire général du « Grem ».

Railway Clearing House :

◆Sir Francis F. **Dent** (*), C. V. O., chairman (member of the Permanent Commission and also delegated by the Southern Railway, England).

Svenska Järnvägsföreningen (Union of Swedish Private Railways) :

G. **Löfmarck,** directeur;

F. **Wickström,** chef de l'exploitation.

Union Internationale des Chemins de fer :

◆A. **Mange** (*), président du comité de gérance (member of the Permanent Commission);

◆G. **Leverve,** secrétaire général.

Union des Voies ferrées et des Transports Automobiles :

◆G. **Bouton,** vice-président du conseil d'administration, administrateur-délégué de la Compagnie des Tramways de l'Est Parisien, vice-président du comité des Tramways de l'Union des Voies ferrées et des Transports Automobiles;

◆J. **Maroger,** ingénieur en chef des Ponts et Chaussées, administrateur de la Société « Les Exploitations Electriques ».

Alphabetical index of Delegates present at the Session, indicating the Sections they attended.

Number.	NAME.	DELEGATED BY	SECTIONS.
722	H. E. **Mohamed Ahmed Abboud** Pasha.	Egyptian Local Organising Committee.	—
326	**Abranches** (J.)	Chemins de fer de la Beira-Alta (Portugal)	1. 2, 3
515	**Acatos** (A.)	Chemins de fer fédéraux (Switzerland)	1, 5
227	**Agerskov** (F.)	Chemins de fer de Lolland-Falster (Denmark)	1, 3
715	**Aguilar Lopez** (M.)	Ministère du Fomento (Spain)	—
557	**Alcock** (W. G.)	Great Indian Peninsula Railway	2, 3, 4
608	**Allard** (A.)	Société Nationale des Chemins de fer Vicinaux (Belgium)	5
183	**Andreae** (C.)	Egyptian Local Organising Committee	1 to 5
520	**Apostolesco** (J.)	Chemins de fer de l'Etat (Rumania)	3
573	**Aubert** (O.)	Ministère des Travaux Publics (Norway)	1. 3
432	**Avery** (G. W. P.)	North Western Railway (India)	2, 3, 4
672	**Bals** (T.)	Chemins de fer roumains (Rumania)	2
170	**Barker** (Sir Henry)	Egyptian Local Organising Committee.	—
103	**Baumann** (H.)	Deutsche Reichsbahn Gesellschaft (Germany)	1, 5
585	**Bégault** (A.)	Compagnie Générale de Chemins de fer et de Tramways en Chine	4
481	**Benedetti** (C. de)	Chemins de fer de l'Etat (Italy)	1. 3
347	**Bener** (G.)	Chemin de fer Rhétique (Switzerland).	1, 3, 5
164	**Benoist d'Erquennes** (Baron L. de).	Egyptian Local Organising Committee.	—
358	**Berkiewicz** (J.)	Chemins de fer de l'Etat (Poland)	1, 3, 5
6	**Besser** (F.)	Permanent Commission of the Association and Reichsverkehrsministerium (Germany)	—
605	**Betbeder-Matibet**	Ministère des Travaux Publics (France).	1, 2
494	**Bevan** (G. J. B.)	Burma Railways	1
725	**Bildt** (Baron H. de)	Swedish Government	—
531	**Bindley** (H. D.)	Sudan Railways.	1. 5
601	**Binkhorst** (P. F.)	Chemins de fer de l'Etat (Dutch East Indies)	1, 3, 5
464	**Blackwood** (N. P. O. R.)	Iraq Railways	4, 5
295	**Blanche** (P.)	Chemins de fer de Damas-Hamah et Prolongements.	2, 5
104	**Bloch** (M.)	Chemins de fer de Paris à Orléans	2, 4
708	**Blyth** (C. E.)	Egyptian Local Organising Committee and Egyptian State Railways	—
243	**Boag** (G. L.)	Great Southern of Spain Railway	3, 4
64	**Bochkoff** (L.)	Permanent Commission of the Association and Chemins de fer de l'Etat (Bulgaria).	1, 2, 3
212	**Boissonnas** (J.)	Chemins de fer de la Province de Santa Fé (Argentine)	4
667	**Bonnet** (E.)	Chemins de fer de Paris à Orléans (France)	1 to 5
366	**Botin y Saenz de Santuola** (E.)	Ferrocaril Cantabrico (Spain).	2, 3, 5

Number	NAME.	DELEGATED BY	SECTIONS.
277	**Bouteau** (M.)	Compagnie Générale des Chemins de fer Vicinaux (France)	5
507	**Bouteloup**	Chemins de fer du Midi (France)	1
533	**Bouton** (G.)	Union des Voies Ferrées et des Transports Automobiles (France)	1, 2, 5
567	**Bovee** (H. B.)	Pennsylvania Railroad Company	4
188	**Boyd** (E.)	Egyptian Local Organising Committee.	—
185	**Boyé** (A. J.)	Egyptian Local Organising Committee.	4
668	**Boysson** (L. de)	Chemins de fer de Paris à Orléans (France)	1 to 5
600	**Braam** (S. van)	Chemins de fer de l'Etat (Dutch East Indies)	2, 5
711	**Braambeek** (H. J. van)	Ministère du Waterstaat (Netherlands)	—
371	**Bravo y Diaz Cañedo** (J. A.)	Chemins de fer du Nord de l'Espagne (Spain)	2, 3, 4
182	**Briggs** (W. T.)	Egyptian Local Organising Committee.	2, 5
325	**Brion** (P. F. de)	Compagnie Nationale des Chemins de fer (Portugal)	2, 4, 5
554	**Burford** (W. B.)	Great Indian Peninsula Railway.	1, 3, 4
541	**Cahen** (M.)	Chemins de fer de l'Est de Lyon (France).	3, 4, 5
222	**Callens** (J.)	Chemins de fer du Bas-Congo au Katanga (Belgian Congo)	3, 4
405	**Campos Henriques** (A. de).	Compagnie des Chemins de fer Portugais (Portugal)	1, 3, 4
606	**Camus**	Chemins de fer Coloniaux de l'Indo-Chine.	—
671	**Cancela de Abreu** (A.)	Chemins de fer de l'Etat dans les Colonies (Portugal)	1, 3, 4, 5
712	**Cant** (R. D.)	Burma Railways	1
346	**Carlander** (O.)	Chemins de fer Västergötland-Göteborg (Sweden)	1, 3 5
484	**Carli** (C.)	Chemins de fer de l'Etat (Italy)	2, 3
621	**Casement** (E. R.)	Railway Board (India)	—
352	**Caspers** (V. C.)	Compagnie Auxiliaire Internationale de Chemins de fer (Belgium)	2
413	**Castrén** (J.)	Chemins de fer de l'Etat (Finland)	1, 3, 4
152	H. E. **Youssef Cattaui** Pasha.	Egyptian Local Organising Committee.	
9	**Cecil** (The Right Hon. Sir Evelyn).	Permanent Commission of the Association and Southern Railway (England)	— 3, 4
175	**Chaker** (J. H.)	Egyptian Local Organising Committee.	—
702	**Mahmoud Chaker** Bey	Egyptian Local Organising Committee and Ministry of Communications, Egypt	—
426	**Chalk** (W. O.)	North Western Railway (India)	2, 3, 4
493	**Chance** (W. H.)	Burma Railways	4
71	**Chantrell** (A. W.)	Permanent Commission of the Association.	—
682	**Chaperon**	Chemins de fer du Nord (France)	3
412	**Chapuy** (P.)	Chemins de fer de Rosario à Puerto Belgrano (Argentine)	3, 4, 5
350	**Chenut** (L.)	Chemins de fer Smyrne-Cassaba et Prolongement	2, 3, 5
474	**Chiossi** (B.)	Chemins de fer de l'Etat (Italy).	2, 3, 4
151	H. E. **Mahmoud Choucri** sha.	Egyptian Local Organising Committee.	—
470	**Codrington** (W. M.)	Great Western of Brazil Railway Company	3, 5

Number.	NAME.	DELEGATED BY	SECTIONS.
316	**Colbert** (F.)	Chemins de fer Guillaume-Luxembourg (Luxemburg)	1, 3
390	**Conrad** (H.)	Chemin de fer Rhétique (Switzerland)	1, 3, 5
165	**Cook** (Sir E.)	Egyptian Local Organising Committee.	—
257	**Cordier** (G.)	Chemins de fer Paris-Lyon-Méditerranée (France)	1 to 5
487	**Corné** (M. de)	Chemins de fer de l'Etat (Italy)	3, 4, 5
404	**Costa** (M.)	Compagnie des Chemins de fer portugais (Portugal)	1, 2, 3
14	**da Costa Couvreur**	Permanent Commission of the Association and Direction Générale des Chemins de fer (Portugal)	1, 2, 3
302	**Couchman** (Sir Francis Dundas).	Madras & Southern Mahratta Railway.	1, 3, 5
613	**Crimi** (M.)	Chemins de fer Circumetnea (Italy)	1, 4, 5
360	**Crombé** (G.)	Compagnie Générale d'Entreprises Electriques et Industrielles « Electrobel » (Belgium)	2, 3, 5
588	**Czapski** (W.)	Ministère des Communications (Poland).	1, 4, 5
107	**Dähnick** (E.)	Deutsche Reichsbahn Gesellschaft (Germany)	2, 5
246	**Dayras** (G.)	Chemins de fer d'Alsace et de Lorraine (France)	4
653	**Decroo**	Société Nationale des Chemins de fer belges (Belgium)	3, 4, 5
17	**Dent** (Sir Francis)	Permanent Commission of the Association and Southern Railway (England)	4
324	**Diniz** (P. J.)	Compagnie Nationale des Chemins de fer Portugais (Portugal)	3, 4, 5
687	**Direz**	Chemins de fer de l'Etat (France)	—
110	**Dolinar** (J.)	Chemins de fer de l'Etat (Jugoslavia).	2, 5
18	**Dorpmüller** (J.)	Permanent Commission of the Association and Deutsche Reichsbahn Gesellschaft (Germany)	1 to 5
319	**Driessen** (Ch. H. J.)	Chemins de fer Néerlandais (Netherlands).	1
586	**D'Souza** (F.)	Railway Board (India)	—
69	**Duchateau** (G. L. A.)	Permanent Commission of the Association.	—
255	**Duchatel** (E.)	Chemins de fer de l'Est (France)	2, 3, 4
639	**Duquesne**	Société Nationale des Chemins de fer belges (Belgium)	—
726	**Ekberg** (E.)	Swedish Government	—
192	**Ibrahim El Chorbagui Bey.**	Egyptian Local Organising Committee.	—
651	**Moustapha Hamdi El Kattan Bey.**	Egyptian Local Organising Committee and Egyptian State Railways	—
112	**Mohamed Kamel El Khishin Bey.**	Permanent Commission of the Association (Reporter)	1, 3, 4
555	**Ensor** (E. L.)	Great Indian Peninsula Railway.	2, 3, 4
233	**Escoriaza** (Vicomte de)	Chemins de fer du Nord de l'Espagne (Spain)	2, 3, 5
403	**Esteves** (R.)	Compagnie des Chemins de fer portugais (Portugal).	1, 2, 3
686	**Ezaki** (Y.)	Government General of Chosen, Railway Bureau	1, 2, 3
253	**Fabry** (R.)	Chemins de fer de l'Est (France)	3, 4
476	**Faccarini (A.)**	Chemins de fer de l'Etat (Italy)	—
710	**Zaki Fahmy Bey**	Egyptian Local Organising Committee and Egyptian State Railways	—

Number.	NAME.	DELEGATED BY	SECTIONS.
475	**Falcone** (G.)	Chemins de fer de l'Etat (Italy)	4, 5
478	**Farne** (F.)	Chemins de fer de l'Etat (Italy)	3
596	**Fernando de Sousa** (J.)	Ministère du Commerce et des Communications (Portugal)	3, 4, 5
328	**Ferreira d'Almeida** (T.)	Companhia portuguesa para a construçao e exploraçao de Caminhos de ferro, Linhas do Vale do Vouga (Portugal)	3, 4, 5
113	**Fettarappa** (C.)	Permanent Commission of the Association (Reporter)	3, 4, 5
445	**Fiocchi** (C. D.)	Chemins de fer Reggio-Emilia (Italy)	—
19	**Fiori** (F.)	Permanent Commission of the Association	1, 2, 4
542	**Flensborg** (H.)	Chemins de fer de l'Etat (Denmark)	1. 2
477	**Forte** (G.)	Chemins de fer de l'Etat (Italy)	1, 2, 4
313	**Fortichiari** (C.)	Chemins de fer du Nord de Milan (Italy)	1, 2, 5
1	**Foulon** (E.)	Permanent Commission of the Association and Société Nationale des Chemins de fer belges (Belgium)	—
21	**Fowler** (Sir Henry)	Permanent Commission of the Association and London Midland & Scottish Railway	1, 2, 3, 4
66	**Fukukawa** (Dr. T.)	Permanent Commission of the Association and Japanese Government Railways	3, 4, 5
115	**Gaeremynck** (O.)	Société Nationale des Chemins de fer belges (Belgium)	1, 3, 4
624	**Gatford** (H.)	East Indian Railway	1, 4, 5
171	**Gaudaire** (E.)	Egyptian Local Organising Committee	—
607	**Gevaert** (E.)	Société Nationale des Chemins de fer Vicinaux (Belgium)	5
22	**Ghilain** (P.)	Permanent Commission of the Association	—
626	**Gibson** (J. C.)	East Indian Railway	2
223	**Gillet** (P.)	Chemins de fer du Bas-Congo au Katanga (Belgian Congo)	2, 3
498	**Glanville** (O. H.)	Burma Railways	3
620	**Goonetilleke** (O. E.)	Ceylon Government Railway	3, 4, 5
485	**Gordini** (M.-A.)	Chemins de fer de l'Etat (Italy)	3, 4, 5
566	**Gradwell** (R. A.)	Great Northern Railway (Ireland)	3
469	**Graham** (J. M.)	Great Western of Brazil Railway	—
372	**Grasset** (E.)	Chemins de fer du Nord de l'Espagne (Spain)	1, 3, 4
24	**Gresley** (H. N.)	Permanent Commission of the Association and London & North Eastern Railway	1, 2, 3
218	**Haerens** (R.)	Railways Economiques de Liége, Seraing et Extensions (Belgium)	4, 5
449	**Hagströmer** (S. de)	Blekinge Kustbanor (Sweden)	4
709	**Abdel Rahman Hamada** Bey.	Egyptian Local Organising Committee and Egyptian State Railways	—
576	**Hamel** (H.)	Deutsche Reichsbahn Gesellschaft (Germany)	3, 4
26	**Harvey** (R. J.)	Permanent Commission of the Association and New Zealand Government Railways	1, 2, 4
178	**Fouad Hassib** Bey	Egyptian Local Organising Committee	—
117	**Hauterre** (E.)	Chemins de fer de l'Etat (France)	3, 4
454	**Hendrich** (O.)	Chemins de fer de l'Etat (Czechoslovakia)	2
638	**Henning**	Société Nationale des Chemins de fer belges (Belgium)	3, 4, 5

Number.	NAME.	DELEGATED BY	SECTIONS.
680	**Herwig** (V.)	Deutsche Reichsbahn Gesellschaft (Germany)	1, 5
180	**Hibbert** (S. R.)	Egyptian Local Organising Committee.	—
318	**Hoekstra** (H. E.)	Chemins de fer Néerlandais (Netherlands).	2
450	**Holmgren** (S.)	Blekinge Kustbanor (Sweden)	1, 2, 3
453	**Houdl** (J.)	Chemins de fer de l'Etat (Czechoslovakia).	3, 4
617	**Hoskiaer** (F.)	Ministère des Travaux Publics (Denmark).	–
517	**Hossu** (J.)	Chemins de fer Roumains (Rumania)	1, 5
118	**Huber-Stockar** (Dr. E.)	Chemins de fer Fédéraux (Switzerland).	2
28	**Hunziker** (H.)	Permanent Commission of the Association and Département fédéral des Postes et Chemins de fer (Switzerland)	1, 3, 4
609	**Ibl** (V.)	Chemins de fer de l'Etat (Czechoslovakia) and Premier Groupement Régional des Chemins de fer Européens, membres de l'Union Internationale des Chemins de fer	3, 4, 5
575	**Irfan** (A.)	Chemins de fer de l'Etat (Turkey)	1, 3, 4
119	**Jacobs** (L.)	Société Nationale des Chemins de fer Vicinaux (Belgium)	2, 3, 5
30	**Jacques** (A.)	Permanent Commission of the Association and Société Nationale des Chemins de fer belges (Belgium)	—
389	**Jacquinot** (P. J. C.)	Chemins de fer Coloniaux de l'Afrique Occidentale française and Chemins de fer et Port de la Réunion (French Colonies)	2, 4, 5
220	**Jadot** (L.)	Chemins de fer du Bas-Conga au Katanga (Belgian Congo)	4, 5
121	**Japiot**	Chemins de fer de Paris à Lyon et à la Méditerranée (France)	2, 3, 4
619	**Jayatilaka** (D. A.)	Ceylon Government Railway	3, 4, 5
618	**Jensen** (C. V.)	Ministère des Travaux Publics (Denmark)	1, 5
32	**Jezierski** (H.)	Permanent Commission of the Association and Chemins de fer de l'Etat (Poland).	1, 2, 3
550	**Jourdain** (F.)	Chemins de fer Secondaires du Nord-Est (France)	2, 4, 5
549	**Jourdain** (P.)	Chemins de fer Secondaires du Nord-Est (France)	2, 4, 5
647	**Kajiura** (K.)	Department of Railways (Japan)	2, 3
700	H. E. Ibrahim **Fahmy Kerim** Pasha.	Egyptian Local Organising Committee and Egyptian Government	—
187	**Knight** (W. D.)	Egyptian Local Organising Committee.	—
34	**Knutzen** (P.)	Permanent Commission of the Association and Ministère des Travaux Publics (Denmark)	2, 4, 5
514	**Labhardt** (E.)	Chemins de fer Fédéraux (Switzerland)	1, 3
290	**Lachèze** (M.)	Chemin de fer de Dakar à Saint-Louis (Senegal)	2, 3, 5
698	**Lajthay** (E.)	Chemins de fer de l'Etat (Hungary)	2, 5
636	**Lamb** (D. R.)	London Midland and Scottish Railway.	2, 3, 4
291	**Larcher** (P.)	Chemin de fer de Dakar à Saint-Louis (Senegal)	3, 4, 5
124	**La Valle**	Permanent Commission of the Association (Reporter)	2, 4, 5
125	**Leboucher**	Chemins de fer du Midi (France)	4, 5

Number.	NAME.	DELEGATED BY	SECTIONS.
602	**Le Fleming** (H. M.)	Federated Malay State Railways	2
640	**Lemaire** (M.)	Société Nationale des Chemins de fer belges (Belgium)	—
721	**Lemon** (A.)	London Midland and Scottish Railway.	—
681	**Leondopoulos** (B.)	Chemins de fer de l'Etat (Greece)	3, 4
126	**Level** (F.)	Compagnie Générale des Voies ferrées d'intérêt local (France)	3, 4, 5
357	**Leverve** (G.)	Union Internationale des Chemins de fer.	1, 3, 4
177	**Lévi** (Dr. I. G.)	Egyptian Local Organising Committee.	—
577	**Lienart** (A.)	Chemins de fer Vicinaux du Congo (Belgian Congo)	3, 5
406	**Lima Henriques** (A. de)	Compagnie des Chemins de fer portugais (Portugal)	3, 4, 5
303	**Lingard** (H.)	Madras and Southern Mahratta Railway.	1, 3, 5
670	**Lisboa de Lima** (A. A.)	Chemins de fer de l'Etat dans les Colonies (Portugal)	—
678	**Lo Balbo** (P.)	Confederazione Nazionale Fascista dei Trasporti Terrestri e della Navigazione Interna (Italy)	5
292	**Lorieux** (L.)	Chemin de fer Dakar à Saint-Louis (Senegal)	1, 3, 5
707	**Macaldin** (J. W.)	Egyptian Local Organising Committee and Egyptian State Railways	—
280	**Mallez** (L.)	Régie Départementale des Tramways de l'Ain (France)	5
38	**Mange** (A.)	Permanent Commission of the Association and Union Internationale des Chemins de fer	2, 3, 4
41	**Margot** (M.)	Permanent Commission of the Association and Chemins de fer de Paris à Lyon et à la Méditerranée	1, 2, 3, 4.
354	**Margot-Noblemaire** (R.)	Compagnie Internationale des Wagons-Lits et des Grands Express Européens (International Sleeping Car Co.)	2, 3, 4
42	**Marguerat** (A.)	Permanent Commission of the Association and Chemin de fer Viège-Zermatt (Switzerland)	4, 5
127	**Mariani** (R.)	Permanent Commission of the Association (Reporter)	2
40	**Marle** (van)	Permanent Commission of the Association and Ministère du Waterstaat (Netherlands)	3 5
252	**Marlio** (L.)	Chemins de fer de l'Est (France)	3, 4
535	**Maroger** (J.)	Union des Voies ferrées et des Transports Automobiles (France)	3, 4, 5
167	**Marryat** (Lt.-Col. J. R.)	Egyptian Local Organising Committee.	—
590	**Martelli** (A.)	Ministère des Travaux Publics (Italy).	3, 4, 5
172	**Martin**	Egyptian Local Organising Committee.	—
289	**Masure** (P.)	Compagnie Fermière des Chemins de fer Tunisiens (Tunis)	1, 2, 4
635	**Matthew** (A. J.)	Sudan Railways	4
683	**Meeking** (L. C.)	Entre Rios Railways Company (Argentine)	1, 2
129	**Mellini** (E.)	Permanent Commission of the Association (Reporter)	1, 3, 5

Number.	NAME.	DELEGATED BY	SECTIONS.
447	**Menada** (G.)	Chemins de fer complémentaires de la Sardaigne (Italy)	1, 2, 3
130	**Mendizabal** (F. D.)	Chemins de fer Madrid-Saragosse-Alicante (Spain)	1, 3, 4
131	**Mermont** (J.-B.)	Chemins de fer de l'Est (France)	3, 4
546	**Metternich** (J. L.)	League of Nations (Permanent Committee on Transportation)	1. 2, 4
70	**Minsart** (E.)	Permanent Commission of the Association.	1, 2, 3
132	**Miszke** (A.)	Chemins de fer de l'Etat (Poland)	1, 3, 5
644	**Miwa** (S.)	Department of Railways (Japan)	3, 4, 5
553	**Moberly** (R. S.)	Great Indian Peninsula Railway.	4
597	**Monteiro de Barros** (P.)	Ministère du Commerce et des Communications (Portugal)	2. 3, 5
656	**Mount** (Lt.-Col. A. H. L.).	Ministry of Transport (Great Britain).	—
274	**Mullet** (G.)	Chemins de fer Economiques du Nord (France)	5
544	**Munck** (O. H.)	Chemins de fer de l'Etat (Denmark)	2 3
440	**Murphy** (J. X.)	Great Southern Railways (Ireland)	3, 5
310	**Nagel**	Chemins de fer de la Méditerranée (Italy).	2, 3, 5
166	**Naus** Bey (Henri)	Egyptian Local Organising Committee.	—
364	**Neumann** (S.)	Chemins de fer de la Fionie Méridionale (Denmark).	3, 4, 5
660	**Newlands** (F.)	London Midland and Scottish Railway.	—
133	**Newlands** (M. A.)	London Midland and Scottish Railway.	1. 4
348	**Nicole** (G.)	Chemin de fer de Lausanne à Ouchy (Switzerland).	3, 5
296	**Nidelet** (L.)	Chemin de fer Damas-Hamah et Prolongements (Asia Minor)	—
345	**Nyström** (Col. J)	Chemins de fer Vastergötland-Göteborg (Sweden)	1, 3, 5
109	**Ocón Cortes** (E. d')	Chemins de fer Madrid-Saragosse-Alicante	3, 4
615	**Ohshima** (S.)	Department of Railways (Japan)	1, 2
694	**Ortmans** (J.)	Compagnie Nationale de Chemins de fer en Colombie (Colombia)	—
155	**Osman Mohamed** Bey	Egyptian Local Organising Commission.	—
612	**Ottone** (G.)	Confederazione Nazionale Fascista dei Trasporti Terrestri e della Navigazione Interna (Italy)	2, 3, 5
311	**Ottone** (L.)	Société Nationale de Chemins de fer et de Tramways and Tramways de Lombardie et de Romagne (Italy)	3, 4, 5
408	**Paiva Couceiro** (M. de)	Compagnie des Chemins de fer portugais (Portugal).	2, 4
518	**Panaitopol** (G.)	Chemins de fer Roumains (Rumania)	2, 3, 4
679	**Parisi** (E.)	Société Nationale de Chemins de fer et de Tramways (Italy)	3, 4, 5
48	**Paul** (J. R.)	Permanent Commission of the Association and Chemins de fer du Midi (France).	4, 5
161	**Pearson** (B.)	Egyptian Local Organising Committee.	—
173	**Pêcher** (V.)	Egyptian Local Organising Committee.	1, 2
283	**Pellé** (M.)	Compagnie des Phosphates et du Chemin de fer de Gafsa (Tunis)	2, 4, 5
589	**Pennavaria** (F.)	Ministère des Communications (Italy).	3, 4, 5
417	**Perin** (R.)	Compagnie Générale de Voies Ferrées d'intérêt local (France)	2, 3, 5

Number.	NAME.	DELEGATED BY	SECTIONS.
581	**Petridis** (J.)	Chemins de fer Pirée-Athènes-Péloponèse (Greece)	3, 4
414	**Petterson** (K. H.)	Chemins de fer de l'Etat (Finland)	2, 3
400	**Philippe** (L.)	Chemins de fer du Maroc (Morocco)	1
595	**Pinto Machado** (C.)	Ministère du Commerce et des Communications (Portugal)	2
214	**Puerari** (H.)	Chemins de fer de la province de Santa-Fé (Argentine)	4
669	**Ramalho** (R. V.)	Chemins de fer du Benguela	2, 3, 4
249	**Regnauld** (C.)	Chemins de fer d'Alsace-Lorraine (France)	2, 4
282	**Renevey**	Chemins de fer Paris-Lyon-Méditerranée.	1 to 5
374	**Reparaz** (F.)	Chemins de fer du Nord de l'Espagne (Spain)	1, 3, 4
355	**Reynek** (B.)	Chemins de fer de l'Etat (Czechoslovakia).	3, 5
157	**Hassan Rifaat** Bey	Egyptian Local Organising Committee.	—
141	**Rijckevorsel** (W. F. H. van)	Chemins de fer Néerlandais (Netherlands).	3, 4
176	**Youssef Risgallah** Bey	Egyptian Local Organising Committee.	—
415	**Roiha** (J.)	Chemins de fer de l'Etat (Finland)	1, 5
483	**Romero** (R.)	Chemins de fer de l'Etat (Italy).	2, 3
713	**Rousseau** (H.)	Chemins de fer de Paris à Orléans	—
655	**Rowntree** (E. W.)	Ministry of Transport (Great Britain).	—
448	**Salvadori di Wiesenkoff** (G.)	Société turinoise de Tramways et de Chemins de fer économiques (Italy)	—
697	**Santini**	Chemins de fer de Paris à Lyon et à la Méditerranée	—
513	**Savary** (E.)	Chemins de fer Fédéraux (Switzerland).	1, 2, 3
695	**Schutz** (R.)	Permanent Commission of the Association (Section Secretary)	—
145	H. E. **Ismaïl Sedky** Pasha.	Egyptian Local Organising Committee (President)	—
704	H. E. **Mahmoud Sedky** Pasha.	Egyptian Local Organising Committee and Ministry of Communications of Egypt	—
54	**Seefehlner** (E.)	Permanent Commission of the Association and Oesterreichische Bundesbahnen (Austria)	1, 2, 3
193	**Hussein Seid** Bey	Egyptian Local Organising Committee	—
658	**Selous** (G. H.)	Ministry of Transport (Great Britain)	—
423	**Shove** (N. A.)	East Indian Railway	2
327	**Sierragorda** (Comte de)	Chemins de fer Central d'Aragon (Spain).	1, 2, 5
511	**Silhol** (A.)	Chemins de fer de Paris à Lyon et à la Méditerranée	1 to 5
169	**Simon** (F.)	Egyptian Local Organising Committee	—
677	**Sirletti** (G. B.)	Confederazione Nazionale Fascista dei Trasporti Terrestri e della Navigazione Interna (Italy)	2, 3, 5
179	**Slaughter** (E. W.)	Egyptian Local Organising Committee.	2, 4
134	**Mohamed Sobhi Ishak** Effendi.	Permanent Commission of the Association (Reporter).	1, 4, 5
703	H. E. **Abdul Hamid Soliman** Pasha.	Egyptian Organising Committee Local and Ministry of Communications (Egypt)	—
275	**Sommier**	Chemin de fer de Somain à Anzin et à la frontière belge (France)	2, 3
135	**Soulez** (E.)	Permanent Commission of the Association (Reporter)	2, 3, 4

Number.	NAME.	DELEGATED BY	SECTIONS.
594	**Souza Rego** (A. de) . . .	Ministère du Commerce et des Communications (Portugal)	—
217	**Spirlet** (A. de)	Chemins de fer du Nord belge (Belgium).	1. 3, 4
427	**Spurgeon** (C. E.)	North Western Railway (India)	2, 3, 4
136	**Stäckel** (W.)	Deutsche Reichsbahn Gesellschaft (Germany)	3
616	**Stehlik** (V.)	Chemins de fer de l'Etat (Jugoslavia) . .	1, 2, 5
365	**Stensballe** (J. P.)	Chemins de fer de la Fionie Méridionale (Denmark)	1, 2, 5
690	**Steyrer** (O.)	Chemins de fer Fédéraux (Austria) . .	2, 3, 4
181	**Stopford** (G. H.)	Egyptian Local Organising Committee. .	—
137	**Student** (E.)	Deutsche Reichsbahn Gesellschaft (Germany).	2
523	**Sullen** (A. E. B.)	Eastern Bengal Railway	1, 4
659	**Swallow** (T. C.)	South African Railways and Harbours. .	—
646	**Taga** (S.)	Department of Railways (Japan) . . .	1, 2
462	**Tainsh** (Col. J. R.) . . .	Iraq Railways	2, 4. 5
529	**Tajani** (F.)	Ministrère des Travaux Publics (Italy). .	3, 4, 5
163	**Mohamed Talaat Harb** Pasha.	Egyptian Local Organising Committee. .	—
643	**Tanaka** (Dr. Y.)	Department of Railways (Japan) . . .	1, 2
504	**Teissier**	Chemins de fer du Midi (France) . . .	4, 5
692	**Teixeira de Queiroz Botelho de Castro e Vasconcelos** (A.).	Chemins de fer de l'Etat (Portuguese Colonies)	—
684	**Teodoreano** (A.)	Ministère des Chemins de fer (Rumania).	—
379	**Tettelin** (F.)	Chemins de fer du Nord (France) . . .	1, 3, 4
72	**Teugels** (V.)	Permanent Commission of the Association (Secretariat)	—
163	**Mahmoud Tewfik Ahmed** Bey.	Egyptian Local Organising Committee. .	—
574	**Tevfik Fazli** (O.)	Chemins de fer de l'Etat (Turkey) . . .	2, 3, 4
706	**Thomas** (R. E.)	Egyptian Local Organising Committee and Egyptian State Railways	—
714	**Torre Eguia** (M. de la) . .	Ministère du Fomento (Spain)	—
693	**Torres** (M. C.)	Chemins de fer de l'Etat dans les Colonies (Portugal)	—
716	**Torres Quevedo y Polanco** .	Ministère du Fomento (Spain)	—
139	**Tosti** (L.)	Permanent Commission of the Association (Reporter)	—
328	**Tuz** (A.)	Chemins de fer de l'Etat (Poland) . . .	3, 4, 5
368	**Urquijo** (Marquis E. de) . .	Chemin de fer central d'Aragon (Spain).	3, 4
661	**Vagnon**	Chemins de fer P.L.M., Réseau algérien.	1 to 5
598	**Vale Monteiro** (R. S. do) .	Ministère du Commerce et des Communications (Portugal)	1
140	**Valeri** (C.)	Permanent Commission of the Association (Reporter)	4
262	**Vallantin**	Chemins de fer de Paris-à Lyon et à la Méditerranée	1, 2, 3, 4
174	**Van der Hecht** (L.)	Egyptian Local Organising Committee. .	—
652	**Vandersypen**	Société Nationale des Chemins de fer belges (Belgium)	2, 4, 5
312	**Vanni** (M.)	Chemin de fer du Nord de Milan (Italy).	—
434	**Vardon** (J.)	North Western Railway of India . . .	1, 3, 4
663	**Velleman** (Dr. A.)	Permanent Commission of the Association (Sectional Secretary)	1 to 5

Number.	NAME.	DELEGATED BY	SECTIONS.
407	**Vicente Ferreira** (A.)	Compagnie des Chemins de fer portugais (Portugal)	1, 3, 4
59	**Vickers** (D.)	Permanent Commission of the Association and London Midland and Scottish Railway	1 to 5
359	**Virion** (A.)	Chemins de fer de l'Etat (Poland)	1, 5
143	**Vlaikoff** (V.)	Chemins de fer de l'Etat (Bulgaria)	1, 2, 3
649	**Wagner** (A.)	Chemins de fer de l'Etat (Poland)	2, 3
689	**Wagner** (E.)	Erie Railroad (U. S. A.)	1, 3
322	**Wagner** (J.)	Chemins de fer de l'Etat (Poland)	2, 3, 4
701	H. E. **Ahmed Abdel Wahab** Pasha.	Egyptian Local Organising Committee and Ministry of Communications	—
304	**Walker** (M. A.)	Madras and Southern Mahratta Railway Company	2, 3, 5
664	**Wang** (Dr. C. C.)	Ministère des Chemins de fer (China)	—
421	**Warlaw-Milne** (Sir John S.)	Bombay, Baroda and Central India Railway	3, 4, 5
321	**Wasiutynski** (A.)	Chemins de fer de l'Etat (Poland)	1, 3, 4
150	H. E. **Hussein Wassef** Pasha.	Egyptian Local Organising Committee.	—
215	**Wauwermans** (P.)	Chemin de fer de Chimay (Belgium)	4, 5
633	**Weaver** (P. W.)	Egyptian Local Organising Committee and Egyptian State Railways	—
184	**Webb** (J.)	Egyptian Local Organising Committee.	—
648	**White** (H. R.)	Bessemer and Lake Erie Railroad	1
62	**Wolf** (P.)	Permanent Commission of the Association and Deutsche Reichbahn Gesellschaft (Germany).	1 to 5
568	**Wood** (G. K.)	Sudan Railways.	2
355	**Woytt** (F.)	Compagnie Internationale des Wagons-Lits et des Grands Express Européens (International Sleeping Car Co.)	2, 3, 4
422	**Young** (S. G. S.)	Bombay, Baroda and Central India Railway	2, 3, 4
615	**Yoyitch** (M.)	Chemins de fer de l'Etat (Jugoslovia)	2, 3, 4
168	**Zollikofer** (A.)	Egyptian Local Organising Committee.	—

OPENING CEREMONY OF THE 12th SESSION,

on the 19 January 1933, at 11 a. m. at the Royal Opera House, Cairo.

The Opening Ceremony of the XIIth Session of the International Railway Congress took place on the 19 January, at 11 a. m. at the Royal Opera House, Cairo, in the presence of His Majesty the King, who was surrounded by the Members of the Cabinet, Their Highnesses the Princes of the Royal Family, the Representatives of the Diplomatic Corps, the High Dignitaries of the Court and the State Administration, as well as of Egyptian and foreign notabilities.

On the Rostrum were seen Their Excellencies Ismail Sedky Pasha, Prime Minister, Ibrahim Fahmy Kerim Pasha, Minister of Communications, Mr. Foulon, President of the Permanent Commission of the International Railway Congress Association, the Members of the Permanent Commission and of the Local Organising Committee, as well as the Official Delegates of the States represented at the Congress.

Before taking his seat on the Rostrum, His Excellency the Prime Minister presented to His Majesty, as a tribute from the Local Organising Committee, an enlarged reproduction of the Congress badge in pure gold, after which His Excellency Sedky Pasha made the following speech :

« Your Majesty,

« May I be allowed to respectfully bow before Your Majesty for the great honour He has most graciously condescended to confer, by His presence at this inaugural meeting of the Railway Congress and to express to Your Majesty our profound gratitude for the interest He has never ceased to show in every phase of human welfare and prosperity.

« And may I also be allowed to convey to Your Majesty our sincerest thanks for the high patronage He has graciously accorded to this Congress which unites the distinguished personalities who most adequately represent their respective countries.

« Ladies and Gentlemen,

« It is a great honour to me to greet you all in the name of the Egyptian Government, to extend to you our warmest welcome, and to express to you our great rejoicing at seeing you amongst us. We are particularly grateful to the Governments that have kindly delegated you as their representatives to attend this Congress. I am sure that I am interpreting the feelings of this honourable Assembly by expressing to the members of the Permanent Commission of the International Railway Congress Association our sincere gratitude for the efficient manner in which they have endeavoured to ensure the success of this imposing Meeting.

« It is also a pleasure to point out to you that Egypt was the first country in Africa, and one of the first in the world, to adopt the system of transport by steam. But the vast project conceived by the

Great Mohamed Ali, the founder of modern Egypt, was not carried out till 1852. In that year Khedive Abbas I concluded an agreement with Robert Stephenson for the construction of the first railway line between Cairo and Alexandria. The scheme was completed four years later, in the reign of Khedive Said Pasha, who also constructed a line betweeu Cairo and Suez.

« During the reign of Khedive Ismail, the Renovator of Egypt, the railway system of the country developed uninterruptedly, and in the course of a few years the total length of the lines increased from 364 to 1348 kilometres.

« The Great War naturally slackened the progress of railways, but soon after, the programme of extension was vigourously resumed, and under the auspices of His Majesty King Fouad, the total length of the lines has now risen to 4013 kilometres.

« I have no doubt, Gentlemen, that the results of your labours and discussions will bring about valuable factors which are necessary for the realisation of our future projects and will give useful hints for the solution of the problems of railway transport, especially those which commonly confront the nations of the world. (*Applause.*)

« Ladies and Gentlemen,

« I hope that you will all carry with you the best remembrance of our dear Egypt, a souvenir as vivid and as lasting as the one which we will keep of your sejourn amongst us.

« Your Majesty,

« It is with the most profound devotion that I declare, in Your Majesty's name, the opening of the XIIth Session of the International Railway Congress. » *(Long applause.)*

Speech made by Mr. Foulon, President of the Association.

« Your Majesty,

« May we most respectfully request Your Majesty to accept the expression of our deepest gratitude for the honour done to us by Your Majesty's presence at this inaugural meeting of the XIIth Session of the International Railway Congress.

« It is for us a great joy to be received in Egypt, a country full of memories thousands of years old.

« The enlightened support that Your Majesty has given to all those who endeavour to discover the mysteries of past civilisations has been crowned by results which form the pride of humanity. (*Applause.*)

« But Your Majesty is not merely anxious to recall to life the past : Your Majesty is anxious to live with His time, to serve progress, to follow the line of its advancement and whenever it is necessary, to help towards it. Whatever definite problems come up, Your Majesty studies them with a most enlightened mind.

« Your Majesty desires for His country, with an admirable perseverance, a methodical development embodying progress in every direction. This firm will has already led to the foundation of the Egyptian University.

« We therefore understand why Your Majesty consents to take an interest in our Congress, where we endeavour to set up an inventory of progress realised in so important a branch of industrial activity, namely that of transport.

« We likewise present our warmest thanks to the Government of His Majesty and to His Excellency the Prime Minister Sedky Pasha, for the cordial welcome he has extended to us.

« We add the expression of our sin-

cere gratitude to the Egyptian Local Organising Committee, which by the arrangements they have made, will allow the Congress to work in most favourable conditions and to realise full success. (*Applause.*)

« Your Majesty,
« Ladies and Gentlemen,

« Transport by rail is traversing a critical period. Certain simple-minded people have even come to the conclusion that our century witnesses the agony of railways. This is an evident mistake.

« It is astounding to hear such opinions expressed at a time when railways develop an accrued activity. In every domain, whether we speak of locomotives, of carriages and wagons, of railway stations or of structures, or again of methods of operation, everywhere we observe undeniable progress. And we are happy that this is so.

« Yes, we shall even have to endeavour to do better still, so that international exchanges may be intensified and may follow the ascendent development of production. By favouring the exchanges, by facilitating them, we may hope to be able to overcome the calamitous consequences of the crises which profoundly disturb the economic activity of the world.

« Railways are the first to suffer from such depressions. They are therefore anxious to overcome them and all their efforts are centred on that purpose.

« I do not want to say anything in anticipation of the discussions that will take place on the problem of coordinating the different means of transport. I will limit myself to saying that railways do not claim protection, but they claim justice in the distribution of obligations and burdens. This justice, I am fully convinced, cannot be realised everywhere in the same way. Different solutions will have to be found in order to take account of the special conditions prevailing in each country and perhaps even in several parts of the same country, but it is probable that all these solutions, however different they may be, will be inspired by one and the same principle, which will be thoroughly studied in the course of the present Session. It is by no means intended to eliminate competition, the usefulness of which is on the contrary recognised. May each means of transport work and develop within its own sphere of action, and progress will lose nothing. Each means of transport will endeavour to improve its efficiency by introducing more scientific technical methods, and greater suppleness in its policy. Each will offer to the travellers, to industry, to trade, an ever increasing amount of comfort, of speed and safety. The desire for economy, which must aim at a reduction of cost price and consequently of the transport tariffs, will only be limited by the desire to carry the instrument of transport to a higher degree of perfection.

« These considerations have guided us in setting up the items placed on the Agenda of the present Session. Amongst these items I mention the following :

« 1. The use of mechanical appliances in the permanent way maintenance and in track relaying.

« 2. Methods to be used to increase the mileage run by locomotives between two repairs including lifting.

« 3. Allocation of freight rolling stock. Methods of reducing the period of turnround.

« 4. Instances of the application in a railway department of the scientific organisation of work. Co-operation of the

staff towards increased efficiency and its participation in the profits.

« 5. Competition between or joint working of railways and airways, or railways and roadways.

« 6. Use of rail motor cars on secondary railway lines.

« The data collected on these questions and on the seven other questions appearing on the Agenda is very full and at the same time of considerable technical value. It is with pleasure that I seize this opportunity of expressing the thanks of the Permanent Commission to the Reporters for the work which they have furnished and which will form the basis of the discussions that are going to take place. These discussions, placed under the August protection of His Majesty, will, I am sure, not merely be a pleasant and interesting exchange of views, but they will lead to practical conclusions of great utility.

« Excellencies, Gentlemen,

« His Excellency the Prime Minister has just extended to us a particularly cordial welcome and he has been good enough to say what interest he takes in our deliberations and what value he attaches to them.

« We are deeply grateful to him for this and express our warmest thanks.

« May I now propose, Gentlemen, to designate as Honorary Vice-President His Excellency Ismail Sedky Pasha who, by consenting to assume the Presidency of the Local Committee, has assured the success of our Congress.

« We shall now have to choose an effective President of the Session; I propose His Excellency Ibrahim Fahmy Kerim Pasha, Minister of Communications, whose authority and great competence are appreciated by all of us.

« I do not doubt but that under his enlightened Presidency the work of the Congress will be crowned with remarkable success.

« As to the Vice-Presidents, I am sure you will unanimously agree to the appointment of two gentlemen who stand in the foreground of the railway world : H. E. Mahmoud Chaker Bey, Under-Secretary of State in the Ministry of Communications, and the General Manager of the Egyptian State Railways.

« The Permanent Commission, in making these proposals, are convinced that, under the leadership of such Officers, the Congress will fully realise the object of its deliberations. (*Long applause.*)

Speech made
by H. E. Ibrahim Fahny Kerim Pasha,
Minister of Communications.

« Your Majesty,
« Highnesses,
« Excellencies,
« Ladies and Gentlemen,

« On this, the first occasion of my rising to address the members of the Railway Congress, my first and foremost duty is to voice my deep appreciation of the signal honour which the Congress has conferred upon me, in selecting me as its President.

« I most heartily thank Mr. Foulon, President of the Permanent Commission of the Association in particular, and his Colleagues, for the great compliment which has been paid to me.

« I fully appreciate that this honour is not due to my personal position, but that it is a tribute paid to my native land, the young and rising Egypt, which, under the aegis of its August Sovereign, Fouad I, now bids fair to occupy the place in the sun to which its past history and present progressive spirit alike entitle it.

« It is this spirit of progress, with which His Majesty King Fouad I will ever be identified, which will enable Egypt to co-operate with the other civilised and forward nations in promoting the welfare and happiness of humanity.

To assist me in carrying out my heavy task, I know that I may count upon the whole-hearted support of the members of this Congress.

« When I recall that these members are the chosen representatives of some of the greatest undertakings in the World's commercial activity, I can appreciate the value of their assistance and co-operation.

« I am confident that the great knowledge and experience which this Congress represents, will ensure its success, and I know that the discussions which will be held and the importance of the problems with which those discussions will deal, cannot but have an inestimable value for railway interests throughout the World, and there are few organisations which have played so great a part in the development of civilisation as the World's railways.

« I hope that wherever you may travel in our beautiful and immortal country you may find your journeys as comfortable and pleasant as we wish them to be for such honoured and welcome guests.

In conclusion, I must ask you to allow me once more to express to you my sincerest gratitude for the great honour which you have conferred upon me.

As a complement to the Congress' Bureau the following appointments have been made :

« *General Secretaries :*

Mr. P. Ghilain, General Secretary of the Permanent Commission;

Youssef Riggallah Bey, Member of the Board of Management of the Egyptian State Railways;

Dr. I. G. Levi, General Secretary of the Egyptian Federation of Industries;

Fouad Hassib Bey, General Secretary of the Council of Ministers;

« *Assistant General Secretaries :*

Sir Henri Fowler, K. B. E., Assistant to Vice-President (Research and Development), London Midland and Scottish Railway;

Herr Wolf, Direktor, Deutsche Reichsbahn Gesellschaft.

« And now to work, to carry out the programme laid before us. » (*Prolonged applause.*)

GENERAL OFFICERS OF THE SESSION

Honorary President :

H. M. KING FOUAD I.

Honorary Vice-President :

H. E. ISMAIL SEDKY Pasha, President of the Egyptian Council of Ministers.

President :

H. E. IBRAHIM FAHMY KERIM Pasha, Minister of Communications (Egypt).

Vice-President :

H. E. MAHMOUD CHAKER Bey, Under-Secretary of State, Ministry of Communications (Egypt).

Statutory Vice-Presidents (1) :

Austria. — Dr. E. SEEFEHLNER, Directeur général des Chemins de fer Fédéraux autrichiens (member of the Permanent Commission of the Association).

Belgium. — E. FOULON, Directeur général de la Société Nationale des chemins de fer belges (President of the Permanent Commission of the Association).

Bulgaria. — L. BOCHKOFF, Directeur général des Chemins de fer de l'Etat.

China. — Dr. C. C. WANG, Manager of the Chinese Government Purchasing Commission.

Czechoslovakia. — V. IBL, Ingénieur, Conseiller ministériel et Directeur des services routiers au Ministère des chemins de fer, Secrétaire général du GREM.

Denmark. — P. KNUTZEN, Directeur général des Chemins de fer de l'Etat danois (member of the Permanent Commission of the Association).

Finland. — J. CASTRÉN, Directeur général des Chemins de fer de l'Etat.

France. — BETBEDER-MATIBET, Ingénieur en chef adjoint au Directeur du Contrôle des études et travaux des lignes nouvelles.

Germany. — F. BESSER, Ministerialrat im Reichsverkehrsministerium (member of the Permanent Commission of the Association).

Great Britain, India, Dominions, Protectorates and Colonies :

A) *Great Britain.* — E. W. ROWNTREE, C. B. E., Assistant Secretary, Ministry of Transport.

B) *India.* — D'SOUZA, Director of Traffic, Railway Board.

Italy. — Prof. A. MARTELLI, Député au Parlement, Ministère des Communications.

Japan. — Dr. Y. TANAKA, Engineer, Department of Railways.

Jugoslavia. — M. YOYITCH, Ingénieur, Directeur adjoint des Chemins de fer de l'Etat.

Netherlands. — Th. M. B. VAN MARLE, Ingénieur, Inspecteur général des Chemins de fer et des Tramways (member of the Permanent Commission of the Association).

Norway. — O. AUBERT, Directeur à l'Administration des Chemins de fer de l'Etat.

Poland. — W. CZAPSKI, Ingénieur, Sous-Secrétaire d'Etat au Ministère des Communications.

(1) Art. 13 of the Rules and Regulations of the Association.

Portugal. — A. DE SOUZA REGO, Directeur général des Chemins de fer au Ministère du Commerce et des Communications.

Rumania. — A. TEODOREANA, Ingénieur au Ministère des Chemins de fer.

Spain. — M. DE LA TORRE EGUIA, Ingénieur au Ministère du Fomento.

Sweden. — Baron H. de BILDT, Ministre de Suède, Cairo.

Switzerland. — H. HUNZIKER, Ingénieur, Directeur de la Division des chemins de fer au Département Fédéral des Postes et des Chemins de fer (member of the Permanent Commission of the Association).

General Secretaries :

P. GHILAIN, Ingénieur en chef au service de la Traction et du Matériel de la Société Nationale des chemins de fer belges (General Secretary of the Permanent Commission of the Association).

YOUSSEF RISGALLAH Bey, Member of the Board of Management, Egyptian State Railways, Telegraphs and Telephones.

Dr. I. G. LÆVI, General Secretary, Egyptian Federation of Industries.

FUAD HASSIB Bey, General Secretary, Council of Ministers (Egypt).

Assistant General Secretaries :

Sir Henry FOWLER, K. B. E., Assistant to Vice-President (Research and Development), London Midland & Scottish Railway (member of the Permanent Commission of the Association).

P. WOLF, Geheimrat, Direktor der Deutschen Reichsbahn Gesellschaft (member of the Permanent Commission of the Association).

OFFICERS OF SECTIONS

SECTION I. — Way and Works.

President : D. VICKERS, Director, London Midland & Scottish Railway, Member of the Permanent Commission of the Association.

Vice-Presidents : O. AUBERT, Directeur de la Voie aux Chemins de fer de l'Etat (Norway).

Dr. Y. TANAKA, Engineer, Department of Railways (Government of Japan).

H. FLENSBORG, Directeur de la Voie et des Bâtiments aux Chemins de fer de l'Etat (Denmark).

Principal Secretary : G. L. A. DUCHATEAU, Ingénieur principal à la Société Nationale des chemins de fer belges.

Secretaries :

R. SCHUTZ, Ingénieur principal au service des Etudes techniques du réseau d'Alsace et de Lorraine (France).

Dr. SAYED Effendi ABDEL WAHED, Chief of the Technical Office, Bridge Department (Egyptian State Railways).

Prof. H. BAUMANN, Direktor bei der Reichsbahn, Deutsche Reichsbahn Gesellschaft (Germany).

SECTION II. — Locomotives and Rolling Stock.

President : E. STUDENT, Reichsbahndirektor, Deutsche Reichsbahn Gesellschaft (Germany).

Vice-Presidents : O. HENDRICH, Conseiller ministériel et Chef du Département V au Ministère des Chemins de fer (Czechoslovakia).

L. BOCHKOFF, Directeur général des chemins de fer et des ports de l'Etat (Bulgaria), Member of the Permanent Commission of the Association.

O. TEVFIK FAZLI, Directeur du Département de la Traction, Chemins de fer de l'Etat (Turkey).

Principal Secretary : A. W. CHANTRELL, Ingénieur principal à la Société Nationale des chemins de fer belges (assistant secretary of the Permanent Commission of the Association).

Secretaries :

L. Santini, Ingénieur au service central du matériel et de la traction (Paris-Lyons-Mediterranean Railway).

Ahmed Rida Kamel Effendi, Technical controller, Ramleh Electric Railway (Egypt).

E. Dähnick, Reichsbahnoberrat im Reichsbahn-Zentralamt für Maschinenbau; Deutsche Reichsbahn Gesellschaft (Germany).

SECTION III. — **Working.**

President : M. Margot, Directeur général, Paris-Lyons-Mediterranean Railway, Member of the Permanent Commission of the Association (France).

Vice-Presidents : Dr. E. Seefehlner, Directeur général des Chemins de fer Fédéraux, Member of the Permanent Commission of the Association (Austria).

M. Yoyitch, Directeur-adjoint des Chemins de fer de l'Etat (Jugoslavia).

E. Savary, Directeur du 1er arrondissement des Chemins de fer Fédéraux (Switzerland).

Principal Secretary : E. Minsart, Ingénieur principal à la Société Nationale des chemins de fer belges (assistant secretary of the Permanent Commission of the Association).

Secretaries :

Chaperon, Chef-adjoint des services administratifs à la Compagnie du Chemin de fer du Nord (France).

Nacuib Effendi Gobran, Rates Controller, Traffic Department (Egyptian State Railways).

W. Stäckel, Reichsbahndirektor und Mitglied der Hauptverwaltung der Deutschen Reichsbahn Gesellschaft (Germany).

SECTION IV. — **General.**

President : Mahmoud Chaker Bey, Under-Secretary of State, Ministry of Communications (Egypt).

Vice-Presidents : H. B. Bovee, European Freight Agent, Pennsylvania Railroad Company.

A. Wasiutynski, Vice-Président du Conseil technique au Ministère des Communications (Poland).

A. A. Lisboa de Lima, Sous-Directeur général au Ministère des Colonies (Portugal).

Henning, Inspecteur en chef adjoint au Directeur de l'Exploitation, Société Nationale des chemins de fer belges (Belgium).

Principal Secretary : A. Allard, Directeur à la Société Nationale belge des chemins de fer vicinaux (Belgium).

Secretaries :

H. Rousseau, Inspecteur principal-adjoint, Paris-Orleans Railway Company.

Salah-el-Dine Effendi Hamdy, Inspector, Traffic Department (Egyptian State Railways).

SECTION V. — Light Railways and Colonial Railways.

President : E. Mellini, Ingénieur, Inspecteur supérieur de l'Inspectorat général des chemins de fer, tramways et automobiles (Italy).

Vice-Presidents : T. C. Swallow, Advisory Engineer, South African Railways and Harbours.

E. Lajthay, Ingénieur principal aux Chemins de fer de l'Etat (Hungary).

Dr. C. C. Wang, Manager of the Chinese Government Purchasing Commission.

Principal Secretary : A. Allard, Directeur à la Société Nationale belge des chemins de fer vicinaux (Belgium).

Secretaries :

H. Rousseau, Inspecteur principal-adjoint, Paris-Orleans Railway.

Salah-el-Dine Effendi Hamdy, Inspector, Traffic Department (Egyptian State Railways).

V. Herwig, Reichsbahnoberrat, Deutsche Reichsbahn Gesellschaft (Germany).

General Interpreter : Dr. A. Velleman.

Programme of the

—	SECTION I. — WAY AND WORKS.	SECTION II. — LOCOMOTIVES AND ROLLING STOCK.
Friday, 20 January . { 9 a. m. / 9.30 a. m.	Installation of the Section and fixing the programme of procedure. I. The protection of level crossings in view of modern developments in road traffic.	Installation of the Section and fixing the programme of procedure. IV. Methods to be used to increase the mileage run by locomotives between two repairs including lifting.
Saturday, 21 January . . 9.30 a. m.	I. The protection of level crossings in view of modern developments in road traffic. (*Continued and end.*)	V. Electrification of railways from an economic point of view. Selection of sites for generating stations. Choice of the kind of current. Safety precautions, etc.
Monday, 23 January . . 9.30 a. m.	II. The use of mechanical appliances in the permanent way maintenance and in track relaying.	IX. Automatic train control and train stop. Track equipment. Locomotive fittings. Methods used for repeating signals on the locomotives. Devices intended to ensure the attention of the drivers. *With Section III.*
Tuesday, 24 January . . 9.30 a. m.	← Plenary	
11.30 a. m.	...	IX. Automatic train control and train stop. Track equipment. Locomotive fittings. Method used for repeating signals on the locomotives. Devices intended to ensure the attention of the drivers. (*Continued.*) *With Section III.*
Wednesday, 25 January . 9.30 a. m.	...	VI. All-metal rolling stock ; carriages and wagons. Use of light metals and alloys. Use of autogenous welding.
11 a. m.	...	...
Thursday, 26 January . 9.30 a. m.	III. The relationship between the vehicle and the track, to ensure safety at high speeds. *With Section II.*	III. The relationship between the vehicle and the track, to ensure safety at high speeds. *With Section I.*
10 a. m. and 3 p. m.	...	...
11.30 a. m.	...	IX. Automatic train control and train stop. Track equipment. Locomotive fittings. Methods used for repeating signals on the locomotives. Devices intended to ensure the attention of the drivers. (*Concluded.*) *With Section III.*
Monday, 30 January . { 9.30 a. m. / 12 a. m.	← Plenary ← Closing	

ctional meetings.

SECTION III. — WORKING.	SECTION IV. — GENERAL.	SECTION V. — LIGHT RAILWAYS AND COLONIAL RAILWAYS.
Installation of the Section and fixing the programme of procedure.	Installation of the Section and fixing the programme of procedure.	Installation of the Section and fixing the programme of procedure.
I. Allocation of freight rolling stock. Investigation into the turn-round of goods vehicles. Separation of the elements included in it. Methods of reducing the period of turn-round.	X. Instances of the application in a railway department of the scientific organisation of work. Co-operation of the staff towards increased efficiency and its participation in the profits.	
I. Organisation for carrying small consignments of goods and the most suitable methods for their delivery with the least delay. Use and selection of fixed and mechanical transhipping plants.	X. Instances of the application in a railway department of the scientific organisation of work. Co-operation of the staff towards increased efficiency and its participation in the profits. (*Concluded.*)	...
X. Automatic train control and train stop. Track equipment. Locomotive fittings. Methods used for repeating signals on the locomotives. Devices intended to ensure the attention of the drivers. *With Section II.*	...	XII. Co-ordination of operation as between heavy and light railways.
eting →		
Automatic train control and train stop. Track equipment. Locomotive fittings. Methods used for repeating signals on the locomotives. Devices intended to ensure the attention of the drivers. (*Continued.*) *With Section II.*	...	...
I. Use of rail motor cars on secondary railway lines. *With Section V.*	...	XIII. Use of rail motor cars on secondary railway lines. *With Section III.*
I. Competition between or joint working of railways and airways, or railways and roadways. *With Section IV.*	XI. Competition between or joint working of railways and airways, or railways and roadways. *With Section III.*	...
I. Use of rail motor cars on secondary railway lines. (*Concluded.*) *With Section V.*	...	XIII. Use of rail motor cars on secondary railway lines. (*Concluded.*) *With Section III.*
I. Competition between or joint working of railways and airways, or railways and roadways. (*Concluded.*) *With Section IV.*	XI. Competition between or joint working of railways and airways, or railways and roadways. (*Concluded.*) *With Section III.*	...
X. Automatic train control and train stop. Track equipment. Locomotive fittings. Methods used for repeating signals on the locomotives. Devices intended to ensure the attention of the drivers. (*Concluded.*) *With Section II.*	...	...
eting →		
mony →		

Summary report of the discussions in the sections.

1st SECTION. — Way and works.

President : D. VICKERS.
Vice-Presidents : O. AUBERT, Dr. Y. TANAKA, and H. FLENSBORG.
Principal Secretary : G. DUCHATEAU.

QUESTION I.

The protection of level crossings in view of modern developments in road traffic.

Preliminary documents.

1st report (America, Great Britain, Dominions and Colonies, China, Japan and Egypt), by Mr. M. A. NEWLANDS. (See *Bulletin*, April 1932, p. 329, or special issue No. 2.)

2nd report (Belgium, Spain, France, Italy, Netherlands, Portugal and their Colonies, Denmark, Finland, Luxemburg, Norway, Sweden and Switzerland), by Mr. BATICLE. (See *Bulletin*, August 1932,) p. 1641, or special issue No. 25.)

3rd report (other countries), by Mr. A. MISZKE. (See *Bulletin*, July 1932, p. 1283, or special issue No. 20).

Special Reporter : Mr. A. MISZKE. (See *Bulletin*, January 1933, p. 1.)

Report of Section I.

(See *Daily Journal of the session*, No. 2, p. 3, No. 3, p. 4, and No. 5, p. 4.)

Meeting held on the 20 January 1933.

THE PRESIDENT calls upon Mr. MISZKE (*Special Reporter*) who reads extracts of the summary taken from the reports of Messrs. NEWLANDS, BATICLE and MISZKE.

THE PRESIDENT asks the reporters if they wish to add anything to the extracts read.

Mr. NEWLANDS (*Reporter*) considers the expenses necessary for increasing the safety of traffic on level-crossings, due to the growth of road traffic, cannot be borne by the railways because they are the result of the development of a competitive means of transport. He thinks, furthermore, that it would be difficult to introduce uniform legislation in all countries, because traffic conditions may be quite different.

Mr. BETBEDER-MATIBET (*French Government*), replacing Mr. BATICLE who is unable to attend the Congress, expresses the point of view of the French Government whose duty is to take care of the

safety of road traffic. Public opinion, in France, is generally not in favour of abolishing the guarding of level-crossings. As far as France is concerned, the savings due to the suppression of guarding would not be considerable, as this work is done by the wives of permanent way men living on the site.

The President proposes to proceed at once with the discussion of the conclusions of the special report. After a discussion in which Messrs. Miszke, Newlands and Betbeder-Matibet, took part, the Meeting agrees to the withdrawal of the first conclusion, which is only of a historical nature.

Mr. Miszke then reads Summary No. 2 and adds certain comments. He insists upon the value of the uniformity of regulations relating to signalling at level crossings.

Mr. Newlands does not ignore the value of such regulations, but repeats his preliminary statement that he deems it exceedingly difficult to arrive at a practical result owing to the extreme diversity of local conditions.

Mr. Betbeder-Matibet agrees to Summary 2 with some modifications; he thinks it advisable to dispense with legislative measures in order to avoid difficulties which arise from the intervention of Parliaments.

Mr. Hossu (*Rumanian State*) disapproves the modification of Summary 2 in this sense; it is not indispensable to have standard regulations, but the principles on which these are based must be uniform.

Mr. Betbeder-Matibet brings to notice that it is the uniformity of the signals which interests the public and not that of the regulations.

Mr. Driessen (*Netherlands Railways*) agrees to Summary 2 and wishes that it should not be confined to Administrations affiliated to the Association.

After a discussion in which Messrs. Betbeder-Matibet, Hossu, Driessen, Newlands, Dr. Tanaka (*Japanese Railways*) and Czapski (*Polish Government*) take part, two tendencies are definitely marked : one is in favour of uniform types of signals only and the other of both regulations and signals. Two texts interpreting these tendencies are presented by Mr. Betbeder-Matibet and Mr. Hossu and submitted to the choice of the Meeting.

The following text is adopted :

« As thanks to the use of motor vehicles, road traffic, formerly local, has been transformed into high-speed traffic and becomes more and more international, the Congress invites all countries to adopt legislation and regulations inspired by uniform principles relating to the protection of level crossings and the types of signals. »

Owing to the suppression of Summary 1 of the special report the above text will be numbered as Summary No. 1.

— The Meeting is then closed.

Meeting held on the 21 January 1933.

The President calls on Mr. Miszke to read and comment upon Summary 3. He asks the members if they have any objection. After speeches by Messrs. Hossu and Betbeder-Matibet, the summary is accepted with a slight modification of form.

Summary 4.

Mr. Tettelin (*Nord Railway, France*) draws attention to the importance of this conclusion and recommends the addition of a comment on the justification for the proposed measures and submits a text which he considers adequate.

Mr. Miszke agrees in principle but considers that the proper allocation of a part of this text should be between summaries 11 and 12 of his report.

The President asks whether the Meeting agrees to the text, with the addition made by Mr. Tettelin.

Mr. Betbeder-Matibet is of opinion that the points of view laid down in the second paragraph of this summary are the business of the Court and not of the Railway Administration and suggests the deletion of this paragraph.

Mr. Level (*Compagnie Générale des Voies Ferrées d'Intérêt Local, France*) does not agree and contends that this would mean holding the Railways responsible for accidents resulting from the imprudence of drivers. He proposes a slight modification of the summary, putting the words, « it must be understood » for « it should be clearly laid down ».

Mr. Betbeder-Matibet holds to his statement and declares that be cannot accept the proposed text. The assembly declines this point of view and approves the second paragraph, slightly modified in form as suggested by Mr. Level.

Mr. Newlands refers to statistics made in England and in the United States and arrives at the conclusion that the protection offered by signals is far from being equivalent to that ensured by gates and adds that he would accept the wording if the phrase « traffic of average intensity » is replaced by « light traffic ».

Mr. Miszke points out that this modification would be a retrogradation from the summaries adopted at the London Congress.

Mr. Driessen (*Netherlands Railways*) states that it is not judicious to place on an equal footing fixed and automatic signals : the former indicate the existence of level crossings, whereas the latter announce the arrival of trains. He would prefer to retain the wording « road traffic » to « traffic » only, at the beginning of this summary.

Mr. Jourdain (*Chemins de Fer Secondaires du Nord-Est, France*) proposes to replace « automatic or fixed signals » by « appropriate signalling ».

Mr. Driessen and Mr. Fiori (*State Railways, Italy*) support this proposal, which is adopted by the Meeting.

Mr. Level does not agree with Mr. Driessen that it is necessary to add the word « road »; the Meeting declines the proposal and agrees to the suppression of the word « road » in the second line of the summary.

The President points out that the proposal made by Mr. Tettelin, seconded by Mr. Miszke, has still to be considered.

Mr. Miszke reads the text which he suggests for insertion partly before Summary 4 of the special report and the remainder between Summaries 11 and 12.

The Meeting approves this proposal.

The text added is given under Nos. 3 and 12 hereafter.

Summary 5. — Adopted.

Summaries 6 and 7.

Mr. Bouteloup (*Midi Railway, France*) proposes the interchange of the numbers of these summaries and that they should be put in the following form : « *Summary 6 :* In case of insufficient visibility — taking into account the speed of trains — fixed signs are good enough where the number of trains is limited and the road traffic is not heavy. » — *Summary 7 :* « But if both traffics are heavy — also in case of insufficient visibility, automatic signalling is recommended. »

This proposal is adopted by the Meeting.

Summary 8. — Adopted.

Summary 9. — Deleted in accordance with the proposal of Mr. Tettelin.

Summary 10. — Accepted, after replacing the words « It is important » by « It is recommendable. »

Summary 11. — As regards the choice of the colours the speakers cannot come to an agreement and the Meeting decides to substitute « in stripes of two colours alternately » for « in white and red stripes. »

Summaries 12 and 13. — Adopted.

Summary 14. — After hearing the points of view of Messrs. Betbeder-Matibet, Miszke, Tanaka, Newlands, Tettelin and Hossu, the assembly decides to omit summary 14.

Summary 15. — Mr. Tettelin points out that the admittance of this summary in France would create trouble and would impose responsibilities on the railways in certain cases where they are not involved. He thinks that the proper way is to leave it for the driver to regulate the speed when crossing the railway.

Mr. Jourdain and Mr. Ottone (*Confederazione Nazionale Fascista dei Trasporti*) support this contention and the Meeting decides to omit this summary.

Summary 16. — Omitted according to the proposal of Mr. Newlands.

The President states that the following summaries are finally adopted :

Summary.

« 1. As thanks to the use of motor « vehicles, road traffic, formerly local, « has been transformed into high-speed « traffic and becomes more and more in- « ternational, the Congress invites all « countries to adopt legislation and re- « gulations inspired by uniform prin- « ciples relating to the protection of level « crossings and the types of signals.

« 2. The most effective solution as re- « gards the crossings of the roads with « the railways, the construction of over « and under-passages, can only be app- « lied in limited cases to crossings of « roads with very heavy traffic, with « main line railways. This solution « cannot be taken into consideration as « a more or less general rule in view of « the exorbitant cost it would involve.

« 3. In the *United States* the number « of guarded level crossings is diminish- « ing : in 1927 it was only 5 957 out of « a total of 232 000 level crossings. In « certain States the gates are not con- « sidered as satisfactory for fast road « traffic and they are replaced by a « *written notice*, a *flashing sign* or by a « *keeper* on the site, who stops the road « cars when a train arrives.

« In *Europe*, on the contrary, there are « methods still in use which relate to « times when the road traffic was quite « different from the present. Efforts « are now made to announce the arrival « of trains at guarded level crossings with « heavy traffic on either railway or road « and in case of insufficient visibil- « ity towards the railway. The suppres- « sion of gates would, however, signify a « progress because the halts on the road « would be reduced to a minimum and « the risk of accidents caused by closed « gates independently of the passage of « trains, would be eliminated.

« 4. In the case of level crossings « where the traffic is of average in- « tensity, it is desirable to consider that « an appropriate signalling gives a de- « gree of protection which is not in- « ferior to that given by the gates and « has this advantage that it interferes « less with the road traffic and prevents « the accidents resulting from collisions « with the gates, so frequently reported.

« If the signalling of level crossings is « required by the law it must be well « understood that the railway adminis- « tration is not responsible for accidents « occurring at level crossings, in the « same way as the road administration « is not responsible for accidents occur- « ring at crossings of public roads.

« 5. Fixed signs in the form of a « St. Andrew's cross preceded, in the « case of roads over which the road mo- « tor circulation is heavy, by an advan- « ced warning sign, should be considered « as sufficient protection so long as the « visibility is good enough.

« 6. In case of insufficient visibility « — taking into account the speed of « trains — fixed signs are good enough « where the number of trains is limited « and the road traffic is not heavy.

« 7. But if in this case of insufficient « visibility both traffics are heavy, auto- « matic signalling is recommended.

« 8. The gates should be retained at « crossings with very heavy traffic on « the road and on the railway, when « the automatic signalling is not suffi- « cient, and when keepers and the re- « gulation of the road traffic appear to « be necessary.

« 9. It is recommendable to facilitate « the work of the keepers by having the « trains announced to them by the « neighbouring signal boxes if they are « near enough, or by a system of auto- « matic signals.

« 10. To increase the visibility of the « signs and of the gates they should be « painted in stripes of two colours alter- « nately to make them more striking to « the eye and they should also, as far « as possible, be fitted with cat's eye « reflectors.

« 11. In view of the fact, on the one « hand, that the organisation of protec- « tion on the above lines might be very « costly, and the construction of over « and under-passages would be even more « so, and furthermore that the road mo- « tor traffic at high speed does not select « the shortest road, but rather a good « one even if longer, and that conse- « quently the road traffic is concentrated « on a restricted number of level cross- « ings, an endeavour should be made to « reduce as much as possible the number « of road crossings with the railways by « abolishing level crossings with little « traffic, by diverting the traffic towards « those which, having a heavier road « traffic, are fitted with adequate si-

« gnalling systems and warning devices « or gates, and by building under and « over-passages at the places where the « heaviest road traffic is concentrated. « When drawing up schemes for build- « ing and rebuilding the roads, these cir- « cumstances should be taken into ac- « count.

« 12. Following these ideas, and in « accordance with the American practice « (State of New York) the level crossings « can be classified into three groups :

« I. Unguarded level crossings without « gates and without automatic signalling « of the arrival of trains.

« II. Unguarded level crossings without « gates but with automatic signalling of « the arrival of trains.

« III. Guarded level crossings with or « without gates.

« The first category involves the level « crossings where the visibility on the « railway is good and where the num- « ber of trains per day does not exceed « 100 and the product of the number of « trains, multiplied by that of the road « vehicles is under 70 000, as well as the « level crossings with insufficient visi- « bility, limited rail traffic and light cir- « culation on the road. »

« The second category involves level « crossings where the visibility on the « railway is not sufficient and where the « other conditions are fulfilled.

« The third category involves other « level crossings with heavier traffic. « The most important among these are « generally replaced by over or under- « passages.

« 13. As the increase of the diffi- « culties at level crossings has been caus- « ed by the formerly unknown intensity « of the road traffic, the road should « assume the cost of constructing the « over and under-passages as well as « those for the additional protection of « the crossings required by the growth « of the road traffic. »

QUESTION II.

The use of mechanical appliances in the permanent way maintenance and in track relaying.

Preliminary documents.

1st report (United States of America, Great Britain, Dominions and Colonies, China and Japan), by Mr. F. M. Thomson. (See *Bulletin*, May 1932, p. 661, or separate issue No. 7.)

2nd report (Latin America, Belgium, Spain, France, Italy, Netherlands, Portugal and their Colonies; Denmark, Finland, Luxemburg, Norway, Sweden and Switzerland), by Messrs. D. Mendizabal and J. Garcia Garin. (See *Bulletin*, August 1932, p. 1567.)

3rd report (other countries), by Mohamed Kamel El Khishin Bey. (See *Bulletin*, June 1932, or separate issue No. 14.)

Special Reporter : Mr D. Mendizabal. (See *Bulletin*, January 1933, p. 29.)

Report of Section I.

(See *Daily Journal of the session*, No. 4, p. 3, and No. 5, p. 4.)

Meeting held on the 23 January 1933.

The President opens the Meeting at 9.30 a.m. and calls upon Mr. Mendizabal (*Special Reporter*), who commences by thanking the different Administrations for the information they had given and briefly explains his report. He observes that the world financial crisis prevailing

does not permit of the normal development of mechanical appliances for the maintenance of track, since the Congress of Madrid.

— The discussion of the summaries then follows.

Summaries 1 and. 2.

Mr. Tettelin (*Nord Railway, France*) is afraid that the adoption of Summary 1 would not give a true impression of the results obtained up to the present. The results of the tests made were so far small, but they were favourable. He suggests modifying the form of Summary 1 and amalgamating in with Summary 2.

After exchanging views, in which Mr. Herwig (*Deutsche Reichsbahn*), Mr. Newlands (*London Midland and Scottish Railway*) and Mr. Mendizabal (*Special Reporter*) participed, Mr. Mendizabal, in conjunction with Mr. Tettelin, submits a draft for the approval of the Meeting. This draft is adopted and it appears as Summary 1.

Summary 3.

Mr. Herwig suggests the suppression of this summary. He points out that in Germany there is no such distinction in practice, and that maintenance work with mechanical appliances is either done by contractors or by the Administration itself, dependent upon local conditions. He also fears that the contractors might take advantage of this summary and insist on carrying out work which would better be carried out by the Administration itself.

The President observes that he does not think such fear is justified, as the summary is only made in a general form.

— Summary 3 is therefore adopted.

Summary 4.

Mr. Herwig wishes to add, to the operations appearing in this summary, renewal work by means of completely assembled track sections.

Mr. Hossu (*Rumanian State Railways*) suggests also adding machines for cutting and drilling rails.

Mr. Newlands suggests as a further addition the welding of crossings and mechanical lubrication of rails on curves.

Mr. Mendizabal says that although he admits the advantages of these points, he has only mentioned in his report the operations which are carried out generally by different Railway Administrations.

Finally Summary 4 is adopted with the addition of the operation consisting of renewing track by means of completely assembled sections.

Summary 5.

Mr. Herwig says that the German State Railways have presented to the Madrid Congress economic information concerning the different operations for maintenance by means of mechanical appliances. He also points out that it is more useful to consider the details separately, than the balance sheet of the work as a whole, as circumstances differ widely in various countries.

Mr. Driessen (*Netherlands Railways*) suggests the suppression of the first half of Summary 5 and that the second half should be added to Summary 6. After an exchange of views between Messrs. Quevedo y Polanco (*Spanish Government*), Gatford (*East Indian Railway*) and Mendizabal, the suggestion of Mr. Driessen is adopted.

Summaries 6 and 7.

After the suggestion of Mr. NEWLANDS that Summaries 6 and 7 are really commentaries of a historical nature, the Meeting decides to omit these summaries and to add the last part of Summary 5 at the end of Summary 8, making them into one Summary.

Summary 8. — Adopted without discussion.

THE PRESIDENT states that the following summaries are approved :

Summary.

« 1. Although mechanical methods of « maintenance and renewal of the track « have been on trial and in use for some « years, only a limited number of Rail- « way Administrations have adopted « them definitely and generally.

« The time that has elapsed since the « introduction of these methods is very « short and no definite conclusion can be « drawn from the results obtained, al- « though the Administrations using « them have found them convenient.

« The small number of trials may be « attributed to circumstances arising « from the world economic crisis.

« 2. It may be noted that maintenance « work is usually carried out by the « Railway Administrations *themselves*, « while renewals are done by *contract;* « this must not, however, be taken as a « general rule.

« 3. Among the operations successfully « performed by mechanical appliances « the following may be noted :

« *a*) Transport of staff and material « by trolleys;

« *b*) Transport of ballast in special « wagons;

« *c*) Screwing screw spikes;

« *d*) Tamping sleepers;

« *e*) Screwing fishbolt nuts;

« *f*) Sifting and grading ballast;

« *g*) Adzing and boring sleepers;

« *h*) Weeding;

« *i*) Taking off, carrying away, and « laying totally assembled track.

« 4. In view of all this, this interesting « investigation should not be considered « as completed. The subject of this « question should therefore be kept be- « fore future congresses, acknowledging « at the same time that much new in- « formation has become available since « 1930.

« It is hoped that the Administrations « carrying out trials will continue to « keep detailed records in order to fur- « ther the solution of the problem of « the comparison of cost between me- « chanical appliances and hand labour. »

QUESTION III.

The relationship between the vehicle and the track, to ensure safety at high speeds :

A) *Weight of vehicles per axle, position of the centre of gravity, wheel arrangement, layout to facilitate running through curves.*

B) *Track resistance, widening of gauge, radius of curves, superelevation, transition curves, points and crossings, check rails.*

Preliminary documents.

1st report (America, Great Britain, Dominions and Colonies, China and Japan), by Messrs. S. MATSUNAWA, S. KUROKOCHI and K. ASAKURA. (See *Bulletin*, June 1932, p. 1045, or separate issue No. 16.)

2nd report (all countries except America, Great Britain, Dominions and Colonies, China, Japan, Germany, Denmark, Finland, Norway, Spain, Netherlands,

Portugal and their Colonies, Sweden and Switzerland), by Mr. Hynek Deyl. (See *Bulletin*, November 1932, p. 2141, or separate issue No. 36.)

3rd report (Germany, Denmark, Finland, Norway, Spain, Netherlands, Portugal and their Colonies, Sweden and Switzerland), by Messrs. H. Baumann and F. Jaehn. (See *Bulletin*, December 1932, p. 2251, or separate issue No. 37.)

Special Reporters : Messrs. R. Despret and A. W. Chantrell. (See *Bulletin*, January 1933, p. 34.)

Report of Sections I and II combined.

(See *Daily Journal of the session*, No. 7, p. 2, and No. 8, p. 2.)

Meeting held on the 26 January 1933.

The Meeting opens at 9.30 a.m., Mr. Vickers being in the Chair.

The President calls upon Mr. Chantrell (*Special Reporter*) who briefly comments his report (part A : the vehicle). He asks Mr. Baumann (*Reporter*) if he has anything to add to the commentary.

Mr. Baumann replies that he has nothing to add, besides congratulating and thanking Mr. Chantrell for the way in which he dealt with the subject, which was a rather difficult task.

The President asks the Meeting if anybody has anything to say in regard to the points developed in the special report.

Mr. Baumann makes the remark that the guided length of electric locomotives is always realised thanks to powerful controlling gear.

Mr. Wood (*Sudan Railways*) remarks that there are important differences between the values of the initial centring forces indicated in the various reports. He would like to know whether these differences are influenced by tyre wear.

Mr. Baumann, insisted on the necessity of maintaining the horizontal reaction on the wheels as low as possible, in order to guarantee safety. He draws attention to the Winterthur type controlling gear which provides a progressive centring force.

Sir Henry Fowler (*London Midland & Scottish Ry.*) emphasises the importance of the question raised by Mr. Wood concerning tyre wear, especially on the leading coupled wheels of the 4-6-0 locomotives. He mentions that some experiments are taking place on the London Midland & Scottish Railway.

Mr. Baumann points out that the results of the studies made essentially relate to static conditions.

As regards guiding, safety from the static point of view is maintained as long as the leading wheels are sufficiently loaded, and the horizontal reaction remains relatively low.

Mr. Baumann insists upon the importance of the combined springs in the bogies, especially when there is a bearing surface of large diameter.

Mr. Newlands (*London Midland and Scottish Ry.*) mentions the possibility of derailment of heavy trains running through curves at high speed caused by sudden application of the brakes.

Mr. Tevfik Fazli (*Turkish State*) mentions a case of derailment which happened in such circumstances, on a gradient

of 1 in 63 but only after the train had cleared the curve.

The President then examines the summaries proposed by the Special Reporter, and asks if no Delegate wants to speak.

Mr. Baumann states that the experience of the Deutsche Reichsbahn shows safety is best assured in the case of 8-wheeled tenders when 2 bogies are provided. He proposes to complete Clause 1 as follows: « For 8-wheeled tenders, it is recommended to utilise two bogies. »

Summary 1 is adopted with the above modification.

Mr. Renevey (*Paris-Lyons-Mediterranean Rys.*) thinks that with regard to Summary 2, the term « marked tendency » is too definite and does not apply to general practice. He suggests the words « a certain tendency ». This modification is approved.

Summaries 3, 4 and 5 are also adopted without any remarks.

Summary 6 is then examined.

Mr. Renevey points out that the first paragraph of this summary, which says : « safety against derailment decreases as the diameter of the guiding wheel increases, etc. » gives the impression that one has to adopt wheels with very small diameter. This cannot be done owing to switches, crossings, etc., which necessitate a certain minimum diameter. He suggests to eliminate this part of the summary.

Mr. Baumann draws attention to the fact that the summary is a translation of the new formula proposed instead of the classic formula of Marié, and it would be an omission not to mention the effect of the diameter of the wheel.

After a discussion between Messrs. Renevey and Baumann, Summary 6 is adopted with the following additional modification : « It must be understood that the diameter of the guiding wheel cannot be less than the limit imposed by the other elements considered. »

The President asks whether the Meeting agrees to Summary 7 with deletion of the words : « the results of which will possibly be communicated to the Congress. »

Mr. Baumann insists upon the fact that in the adopted summaries only the static point of view of the problem has been considered.

These static conditions are only realised for very low speeds, but at high speeds the dynamic forces and the friction of the springs and other suspension gear come into account and change the aspect of the problem. During the tests, these frictional forces have been found far more important than supposed in the very beginning.

Mr. Baumann expresses the hope that the next Congresses will study the question from this aspect and asks that Summary 7 takes these considerations into account.

The following wording is approved :

« 7. The preceding conclusion refers to the question of safety against derailment only from the static point of view. Research work and trials are now being carried out on several railways for the investigation of the dynamic forces, taking account of the friction in the suspension gear. Owing to the importance of the problem, the Congress recommends the continuance of these studies and researches. »

Then the part of the report dealing particularly with the track is examined. Mr. Despret (*Special Reporter*) being

absent, THE PRESIDENT proposes to discuss at once the summaries.

Summary 1.

Mr. HERWIG (*Deutsche Reichsbahn*) proposes the first two paragraphs of the conclusion to read as follows: « The computation of the strength of the railway track is especially an experimental matter.

« Research work undertaken by some railways ought to be encouraged and followed with interest. » — Adopted.

Summary 2. — Adopted.

Summary 3.

Mr. TETTELIN (*Nord Railway, France*) does not want to modify this conclusion. But he calls the attention of the Meeting to an interesting point in Mr. BAUMANN's report, stating that, for reasons of safety, the superelevation on the curves must not be less than a certain amount of which he gives the formula. However, on the French Nord Railway, there exist at Creil (at the junction of the Paris-Calais and Paris-Brussels lines) two curves of 945-m. (47 1/4 chains) radius without any superelevation. Although about forty trains are running daily at 90-km. (56 miles) per hour over this line, no accident has happened. It seems then that in case of curves with great radii, superelevation is not essential for safety.

Summary 3 is adopted.

Summary 4.

Mr. HERWIG is of the opinion that the proposed text is too rigid, at least as it appears in the German version.

Mr. TANAKA (*Japanese Government Railways*) is of the same opinion.

Summary 4 is adopted but on adding after « should be so laid out » the words « as far as possible ».

Finally, THE PRESIDENT states that the following summaries have been adopted :

Summary.

A. — THE VEHICLE.

« 1. For high-speed steam locomotives, « guiding by four-wheeled carrying bo- « gies is found to be the general practice. « Two-wheeled trucks are more rarely « used.

« High-speed electric locomotives have « four-wheeled carrying bogies, or bo- « gies with 2 carrying wheels and 2 driv- « ing wheels or two-wheeled trucks, or « a bogie for one direction of running « and a two-wheeled truck for the other, « or again two driving bogies.

« It is recommended that the vehicle « should be guided by the bogie centre « pin only, that a long rigid wheel base « be provided with as long a guided « length as possible.

« For 8-wheeled tenders it is recom- « mended to utilise two bogies.

« 2. Carriages for high-speeds are « preferably bogie vehicles. There is a « certain tendency towards the use of « long wheel base bogies.

« 3. A high centre of gravity of the « locomotive is an advantage as regards « smooth riding. The question of safety « against the locomotive overturning has « been satisfactorily solved everywhere.

« 4. Generally speaking locomotive bo- « gies are provided either with gravity « or spring controlling gear. The initial « centring force should be sufficiently « high and not differ greatly in value « from that of the final centring force.

« 5. Among the various methods of

« suspension for locomotives the arrangement into two transverse planes, with « the engine supported on three or four « points, most satisfactorily ensures that « there is sufficient static load on the « guiding wheels when entering the superelevation incline on leaving a curve.

« 6. Safety against derailment decreases as the diameter of the guiding « wheel, the striking angle, and the co-« efficient of friction increase. On the « other hand the high value for the « angle made by the outer face of the « wheel flange with the horizontal increases the safety. The value of this « angle is however limited by the following considerations : *a*) more rapid « wheel flange and rail wear; *b*) increased resistance on curves.

« It must be understood that the diameter of the guiding wheel cannot be « less than the limit imposed by the « other elements considered.

« In order to reduce the co-efficient « of friction it is desirable that some « efficient and practical solution be « found of the question of lubricating « wheel flanges when running through « curves.

« 7. The preceding conclusion refers « to the question of safety against derailment only from the static point of « view. Research work and trials are « now being carried out on several railways for the investigation of the dynamic forces, taking account of the « friction in the suspension gear. Owing « to the importance of the problem, the « Congress recommends the continuance « of these studies and researches.

B. — The track.

« 1. The computation of the strength of « the railway track is especially an experimental matter.

« Research work undertaken by some « Railways ought to be encouraged and « followed with interest.

« Special attention should be paid to « all trials tending to the elimination of « rail joints — the use of long rails, the « welding of rails, etc.

« 2. The present tendency is to diminish gauge widening and to ensure « closer guiding of the vehicles by the « track. Systematic trials, with this object in view, ought to be pursued.

« 3. The rules used for determining « the speed through curves, the super-« elevations and the transition curves « between circular curves, vary on the « different railways. These factors, « which affect high-speed running « through curves, could usefully be made « the subject of further research work, « which would take into account the « forces called into play when the vehicles are running.

« 4. Turnouts on high-speed tracks « should be so laid out that as far as « possible no speed restriction will be « imposed when they are run over. »

— This summary was ratified by the Plenary Meeting held on the 30 January.

2nd SECTION. — Locomotives and rolling stock.

President : E. STUDENT.
Vice-Presidents : O. HENDRICH, L. BOCHKOFF, and O. TEVFIK FAZLI.
Principal Secretary : A. W. CHANTRELL.

QUESTION IV.

Methods to be used to increase the mileage run by locomotives between two repairs including lifting.

Preliminary documents.

1st report (America, Great Britain, Dominions and Colonies, China and Japan), by Sir HENRY FOWLER. (See *Bulletin*, April 1932, p. 287, or separate issue No. 1.)

2nd report (Germany, Denmark, Finland, Norway, Spain, Netherlands, Portugal and their Colonies, Sweden and Switzerland), by Mr. E. STUDENT. (See *Bulletin*, June 1932, p. 983, or separate issue No. 15).

3rd report (other countries), by Mr. R. KLATOVSKY. (See *Bulletin*, August 1932, p. 1539, or separate issue No. 23.)

Special Reporter : Sir HENRY FOWLER. (See *Bulletin*, January 1933, p. 43.)

Report of Section II.

(See *Daily Journal of the session*, No. 2, p. 4, and No. 5, p. 4.)

Meeting held on the 20 January 1933.

THE PRESIDENT calls on Sir HENRY FOWLER, *Special Reporter*.

Sir HENRY FOWLER suggests that the summary of his special report be taken as a basis of discussion and submits it to the group for examination point by point. He draws attention to a difference of opinion between the report of Mr. KLATOVSKY and the two other reports as regards the main reasons for heavy repairs, Mr. KLATOVSKY attributing them to the necessity of turning the tyres, whilst the other reporters consider them to be the condition of the boiler.

Mr. STUDENT (*President and Reporter*), points out that heavy repairs of the boiler occur at intervals of several years, and that, in the meantime, with the present-day mileages, one, two or even three liftings of the locomotive must take place. He emphasises the importance of the construction of the boiler.

Mr. MUNCK (*Danish State*) says that in Denmark the weight of rails influences the periodicity of the repairs.

Messrs. CHALK and SPURGEON (*North Western Railway, India*) give information concerning the periodicity of heavy repairs in British India.

An exchange of views takes place between Messrs. BALS (*Rumanian State*), DUCHATEL (*French Est*), SPURGEON and

Sir Henry Fowler on the meaning of the expression « heavy repair ». Sir Henry Fowler remarks that the observations contained in his report give the necessary precision.

Mr. Shove (*East Indian Railway*) wonders whether any American colleagues might be able to give some information on welded steel fire-boxes.

The President informs the Section that the Reichsbahn is building a locomotive in which the boiler is entirely welded with the exception of the smoke-box tube plate and the connection plate between the outside fire-box shell and body. He holds himself at the disposal of his colleagues, if they want any further information on that subject.

Mr. Tevfik Fazli (*Turkish State*) points out that in spite of the bad quality of the feed water in Turkey, a mileage of as much as 186 000 miles between two heavy repairs of the boiler is reached with one general repair in the interval.

The President points out that heavy repair of the boiler always takes place with a general repair of the locomotive, but that, as way pointed out by Mr Duchatel, heavy general repairs are indispensable in the interval, as the period between two repairs of the boiler might extend to as much as ten or twelve years. He insists on the importance of frequent washings; in Germany boilers are washed at least twice a month and frequently as much as three or four times.

Mr. Gresley (*London and North Eastern Railway*) points out how difficult it is to make standard recommendations, when the conditions of operation vary so greatly.

The President shows how important it is, from an economic point of view, to lengthen the period between two heavy repairs of the boiler, by inserting into the interval general repairs, which are considerably less costly than boiler repairs. An appreciable reduction of the operating cost per thousand kilometres can thus be obtained.

Sir Henry Fowler mentions that the Americans have not discovered any difference in the life of the tyres according to whether simple or double tapering is used.

Mr. Forte (*Italian State*) draws attention to the importance of experiments that are at present being made in Italy as regards the choice of metal for tyres and rails. He points out that the ratio between the respective hardness of tyres and rails varies considerably so that it may even be inverted. He will be glad to provide his colleagues with any further information they might desire on that point.

Messrs. Bals, Forte, Student and Sir Henry Fowler speak of the influence of low temperatures on the behaviour of tyres in service.

Mr. Wood (*Sudan Railways*) speaks of the difficulties met with in sandy regions with regard to the life of tyres.

Messrs. Shove and Spurgeon make remarks on oil and grease lubrication.

The President is of opinion that it is not possible for the Meeting to come to any positive conclusion with regard to the choice of metals for rails or tyres, the tapering of tyres, lubrication, as the conditions vary too much from one country to another.

As regards point 5, there is undoubtedly a general tendency to increase the daily mileage, which seems justified by the high price of locomotives.

Mr. Duchatel is not sure whether a great daily mileage brings about an increase of the total mileage between heavy repairs; in France, at least, locomotives work always very near their maximum capacity. As a matter of fact, cost price of transportation is the important factor to be considered.

To a question from Mr. Bals, Sir Henry Fowler replies that in every respect it is an advantage to increase the daily mileage.

The President states that generally locomotives are not worked to their maximum capacity. The Reichsbahn used motor-coaches to their maximum capacity and had to give up that practice.

As no further remarks are raised, The President states that the summary is adopted.

Summary.

« 1. One of the chief reasons for locomotives requiring heavy repairs is the attention which has to be given periodically to the boiler. It is, therefore, obvious that boiler design is of primary importance, and arrangements should be made for it to receive suitable water, and for it to be washed out properly.

« 2. Regular and systematic examinations tend to the discovery of defects, and the renewal of worn parts, and so prevent casualties and loss of mileage.

« 3. Tyres usually require to be returned between heavy repairs, and, therefore, every attention should be given to providing material which will give as little wear as possible. The study of the relation of the wear of tyres and rails merits more attention than has so far been given to it.

« 4. Intermediate repairs, where tyres, bearings, etc., receive attention, can be quickly carried out if systematically performed, and materially increase the mileage between heavy repairs.

« 5. There has been a tendency in recent years to obtain a greater mileage per day from locomotives by various means; this is an advantage in itself, and also tends to increase the total mileage between heavy repairs.

« 6. Where it is possible, and the permanent way and loading gauge allow, it is an advantage to employ locomotives which are ordinarily worked well below their maximum capacity. The increased capital cost, however, must be borne in mind. »

— This summary is ratified by the Plenary Meeting held on the 24 January, the words « intermediate repairs » being, however, substituted for « an intermediate repair » in article 4.

QUESTION V.

Electrification of railways from an economic point of view. Selection of sites for generating stations. Choice of the kind of current. Safety precautions, etc.

Preliminary documents.

1st report (America, Great Britain, Dominions and Colonies, China and Japan), by Mr. S. Withington. (See *Bulletin*, April 1932, p. 379, or separate issue No. 3).

2nd report (Belgium, Spain, France, Italy, Netherlands, Portugal and their Colonies, Denmark, Finland, Luxemburg, Norway and Sweden), by Messrs. JAPIOT and LEBOUCHER. (See *Bulletin*, September 1932, p. 1717, or separate issue No. 26.)

3rd report (other countries), by Messrs. E. HUBER-STOCKAR and H. ECKERT. (See *Bulletin*, June 1932, p. 857, or separate issue No. 12.)

Special Reporter : Mr. JAPIOT. (See *Bulletin*, January 1933, p. 47.)

Report of Section II.

(See *Daily Journal of the session*, No. 3, p. 5, and No. 5, p. 4.)

Meeting held on the 21 January 1933.

Mr. STUDENT, *President*, opens the Meeting at 9.30 a.m. and announces that Mr. JAPIOT, being unwell, is unfortunately not able to present the report himself; Mr. LEBOUCHER has kindly consented to do so in his place.

Mr. LEBOUCHER sums up the special report on Question V, whereupon he reads out the summary referring to the first part : *Electrification of railways from an economic point of view.*

THE PRESIDENT is of opinion that the summary is presented in a form so clear and precise that it needs not give rise to a lengthy discussion; he would however be pleased if somebody would speak on the subject under consideration.

Mr. HUBER-STOCKAR (*Reporter*) fully approves the conclusions which seem to him to be a true picture of the several reports. After presenting some general remarks he concludes in supporting warmly the conclusions as they are worded.

Mr. SEEFEHLNER (*Austrian Federal Railways*) refers to an expression used in paragraph I-5 of the summary of the first part : « If money can be obtained at a *low rate* »; he thinks that this is not sufficiently clear and that this is purely a question of appreciation.

Mr. LAJTHAY (*Hungarian State Railways*) is surprised that economic considerations are placed in the foreground, whereas the desire for improvement and modernisation may be the determining motive for electrification.

Mr. HUBER-STOCKAR would be inclined to support this opinion, but thinks that it is sufficiently expressed in the summary and that therefore no amendment is necessary.

Mr. SEEFEHLNER thinks that one might have insisted on the facilities which electrification affords in the struggle against the competition of the motor car, particularly as concerns speed.

THE PRESIDENT remarks that the summary takes into account the observations made by Mr. SEEFEHLNER; he adds that steam locomotives and motor coaches give the possibility of reaching speeds as high as those of electric locomotives. He recalls a passage contained in the report presented by Mr. HUBER-STOCKAR : *Each electrification should as a rule improve the « profit and loss » account of the railway and should not in any event be a charge on it. It ought at least to be possible to anticipate such an improvement.*

Mr. BESSER (*German Government*) referring to conclusion I-5, points out that heavy gradients are favourable for electrification; the expression « easy gradients » might lead to a misunderstanding.

After an exchange of views on the observations made by Messrs. Besser and Seefehlner, in which Messrs. Leboucher, Besser, Seefehlner and de Boysson (*Paris-Orleans Ry.*) take part, the conclusions I-1 to I-6 are adopted with the following amendments : in paragraph 3 the words « low rate » are replaced by « acceptable rate », and the last word « easier » is replaced by « more favourable for electrification ».

Mr. Leboucher reads the conclusions referring to the second part : *Selection of sites for generating stations.*

Mr. Huber-Stockar warmly supports these conclusions; in his opinion the choice of the site is a matter of detail.

— The conclusions are adopted as given.

Mr. Leboucher reads out the summary referring to the third part : *Choice of the kind of current.*

Mr. Student requests that the members should express their opinion on the conclusions, the conditions varying according to the different countries.

Mr. Lajthay proposes not to enumerate the types of current used, in order not to commit the future.

The President observes that the conclusions refer to the present situation, and proposes that they should be adopted as worded.

Mr. Besser makes some reservations as regards conclusion III-1 which might lead people to think that it is not possible to hope for any further technical progress, whereas the use of mercury vapour arc rectifiers opens up new possibilities of development for the three-phase current.

Mr. Mariani (*Italian State Rys.*) observes that the three-phase current which has been in use in Italy for the last 30 years, finds further application only in such places where it has been used from the beginning; new electrifications will be made by making use of direct current, on account of the technical progress that has been realised. He proposes no modification of the text, as the latter corresponds to the opinion at present held in Italy.

Mr. Leboucher proposes an amendment for conclusion III-3, which takes into account the remarks that have been made, and after an exchange of views between Messrs. Besser, Huber-Stockar, Lajthay and Student, the following text is finally proposed for conclusion III-1 :

« The choice of the kind of current for electric traction, formerly influenced by technical considerations, presents itself today as a problem to be solved, either by purely economic considerations or by special considerations. »

The President declares the conclusions referring to part III adopted.

Mr. Duquesne (*Belgian National Ry. Co.*) expresses the desire that, in order to facilitate the future study of electrification, the Congress should place on its agenda questions referring to the standardization of electric equipment, catenary overhead lines, sub-stations, electric apparatus, etc.

Mr. Bals (*Rumanian Rys.*) warmly supports this proposal.

The President observes that it ought to be referred to the Permanent Commission.

Mr. Leboucher reads out the summary referring to part IV : *Safety Measures.*

The conclusions are adopted without discusssion.

Mr. MURPHY (*Great Southern Rys., Ireland*) gives some information concerning the use of the « Drumm » battery on the Great Southern Railways, Ireland; he declares that he will gladly communicate further details to the members who might take an interest in this battery.

THE PRESIDENT thanks Sir HENRY FOWLER and Mr. LEBOUCHER for the very valuable assistance they have given the Section in the examination of Questions IV and V. He declares that the summary of Question V is adopted.

— This is ratified by the Plenary Meeting (24 January) with two alterations to articles I-5 and III-3. The final wording is as follows.

Summary.

I. *Electrification from an economic point of view.*

« I-1. Electrification is in general « characterised, from the economic point « of view, by a heavy increase of the « capital charges, by savings, frequently « considerable, on the operating costs, « and finally by indirect advantages « which may in certain cases play the « predominant part; the balance sheet « of the electrification should therefore « include all these elements.

« I-2. It is always difficult to draw « up this balance sheet accurately, owing « to the incertitude that exists as to the « evaluation of certain factors, some- « times of considerable importance.

« I-3. The diversity of the accountancy « methods make it difficult to compare « the balance sheets prepared by the « different administrations, especially as « regards the industrial amortisation of « the fixed plant and rolling stock.

« I-4. As the total capital charges may « exceed the operating costs in the case « of electric traction, whereas they only « represent a small fraction in the case « of steam traction, fluctuations in traf- « fic are capable of modifying radically « the aspect of the balance sheet of elec- « trification.

« I-5. Apart from special cases (su- « burbs of large cities, mountain lines, « lines on which the limit of capacity « has been reached, abnormally high fuel « costs, etc.), electrification is generally « economical only if money can be ob- « tained at an acceptable rate, if the elec- « tric power can be obtained at a favour- « able price, and if the traffic is propor- « tionately heavier as the profile of the « line is easier.

« I-6. The economic considerations « proper to the railway are not the only « ones which may decide the electrifica- « tion of a line : the decision may be « the result of either considerations re- « lating to the general economics of the « country, or necessities of a technical « nature quite apart from any question « of finance.

II. *Selection of sites for generating stations.*

« II. Under reserve of the special re- « quirements of electric traction, the se- « lection of the sites for the generating « stations supplying power to electrified « railway lines is governed by the same « considerations as in the case of gener- « ating stations feeding ordinary distri- « bution systems or large centres of con- « sumption.

III. *Choice of the kind of current.*

« III-1. The choice of the kind of « current for electric traction, formerly « influenced by technical considerations,

« is today a problem to be solved either « by purely economic considerations or « by special considerations.

« III-2. This choice can only be de- « termined in each case by taking into « account the whole of the conditions of « the problem put forward, and by com- « paring the whole of the expenditure « (operating costs and capital charges).

« III-3. The three-phase system ap- « pears unlikely to be used for new ap- « plications outside the zones in which « it is already in use, so that in the case « of new electrifications the choice would « appear to lie between direct current « and single-phase current only.

« III-4. Although direct current has « been adopted in recent years whenever « it was not a question of extending an « electrification already undertaken on « a different system, or of electrifying « lines closely connected with others al- « ready electrified on a different system, « the two systems, direct current and « single-phase current, appear to be suit- « able for future use in new electrifica- « tions outside their present fields of « application.

IV. *Safety precautions, etc.*

« IV-1. Apart from the safety meas- « ures in general use in all plants using « electrical energy, supplementary meas- « ures have been taken on electrified « lines to protect the public and the staff « against the particular dangers which « the contact lines (trolley wire or con- « ductor rail) and the electrical equip- « ment of the locomotives and rail motor « coaches may present.

« IV-2. The efficacy of these meas- « ures is proved by the few accidents « which can be ascribed to the use of « electrical energy for traction purposes.

« IV-3. Most of these accidents are « the result of a mistake committed by « the victim, his imprudence or his ne- « gligence.

« IV-4. These accidents occur especial- « ly when the electrification is new, « and principally affect the staff still « insufficiently familiar with the steps « to be taken to protect themselves, « whence the necessity for specially look- « ing after this part of the professional « instruction of newly recruited staff, or « staff temporarily employed, as well as « of staff employed by contractors. »

* * *

Mr. WITHINGTON, the American Reporter, who was unable to attend the discussions of the Congress, has pointed out that Summary III-4 does not exactly state the conditions existing in America.

For instance, in the case of the Great Northern Railroad, in the northwestern part of the U.S.A., a decision was made to electrify on the basis of single-phase power distribution, replacing the early three-phase electrification on that railroad. This was not an instance of extending a previous electrification of a single-phase system, as it was necessary to discard practically all the original equipment. As another example : The Reading Company's single-phase electrification recently completed at Philadelphia, is an entirely independent project not connected with any previously existing electrification.

Furthermore, the Pennsylvania Railroad in extending its electrification between New York and Philadelphia, proceeded on the basis of single-phase distribution in spite of the relatively elaborate D.C. system originally installed, and the New Haven Railroad also having had early experience with direct-current, adopted the single-phase system for its main line electrification.

QUESTION VI.

All-metal rolling stock : carriages and wagons. Use of light metals and alloys. Use of autogenous welding.

Preliminary documents.

1st report (America, Great Britain, Dominions and Colonies, China and Japan), by Mr. H. N. GRESLEY. (See *Bulletin*, August 1932, p. 1467, or separate issue No. 22.)

2nd report (all countries except America, Great Britain, Dominions and Colonies, China, Japan, Germany, Bulgaria, Denmark, Finland, Norway, Netherlands and Colonies, Rumania, Sweden, Czechoslovakia and Turkey), by Mr. R. MARIANI. (See *Bulletin*, October 1932, p. 1839, or separate issue No. 34.)

3rd report (Germany, Bulgaria, Denmark, Finland, Norway, Netherlands and Colonies, Rumania, Sweden, Czechoslovakia and Turkey), by Mr. E. DÄHNICK. (See *Bulletin*, November 1932, p. 2059, or separate issue No. 30).

Special Reporter : Mr. E. DÄHNICK. (See *Bulletin*, January 1933, p. 73.)

Report of Section II.

(See *Daily Journal of the Session*, No. 6, p. 3, and No. 8, p. 3.)

Meeting held on the 25 January 1933.

The Meeting opened at 9.30.

Mr. STUDENT (*President*) called upon Mr. DÄHNICK, *Special Reporter*.

Mr. DÄHNICK, before reading the Summaries of his report, observes that the utilisation of the all-metal rolling stock has, in spite of the economic crisis, considerably increased, as might be expected from the conclusions of the Madrid Session. Remarkable results have been obtained for reducing the weight of the rolling stock, by using light metals, autogenous welding and high-resistance metals.

THE PRESIDENT asks Mr. DÄHNICK to read out the conclusions referring to passenger carriages.

Mr. GRESLEY (*Reporter*) agrees to the Summaries presented by Mr. DÄHNICK; he remarks that progress has been less rapid on account of the economic crisis. He adds, however, that in England, one is also afraid of the corrosive action on the outside body panels; moreover, the English public being in the habit of using outside lateral doors provided to each compartment, this leads to certain difficulties from the point of view of construction. He draws attention to a recently built carriage with an all-steel underframé and body-frame, the rest of the body being made of « Alpax » aluminium.

Mr. RENEVEY (*Paris-Lyons-Mediterranean Ry.*) likewise approves the summaries of the Special Reporter, but insists very much on strenghtening the ends of the carriages, as a number of accidents that happened since the Madrid Congress show the necessity thereof.

Mr. MARIANI (*Reporter*) makes several observations based on the experience of the Italian State Railways with regard to carriages that have been put into service in 1922. Countersunk riveting has given full success. It is useless to ensure by tin soldering the water-tightness of the joints of the outside panels. Damage resulting from accidents has been repaired very easily. The utility of strengthening the extremities of the carriages has been proved by several accidents.

Mr. Dähnick confirms that the strengthening of the carriage ends has also been obtained in Germany by a special construction.

Mr. Renevey proposes therefore, to add to number 3 of the summary the following paragraph :

« Experience has shown that it is necessary to give special attention to the strengthening of the ends of the carriages, in order that, in case of collision or overriding, they should offer the greatest possible resistance. »

Mr. Mariani gives some information concerning the buffing and drawing gear of the Italian carriages which lessens the shock by flexible reaction.

Messrs. Tevfik Fazli (*Turkish State Rys.*), Knight (*Egyptian State Rys.*) and Duchatel (*French Est Ry.*) give information concerning temperatures that have been observed in carriages of various types.

Mr. Bloch (*Paris-Orleans Ry.*) wishes to hear from Mr. Dähnick, what reduction of weight has exactly been realised in Germany by the use of autogenous welding.

Mr. Dähnick replies that precise figures were given in his report. He also insists on the advantage of using high-grade steels rather than light metals, as the latter, on account of their higher price and shorter duration in service, are in the long run less economical.

Mr. Forte (*Italian State Rys.*) gives some information on the use of special iron-chrome-molybdenum and iron-nickel-chrome-molybdenum electrodes by which the fragility of certain welds has been overcome.

Mr. Student infers that the Meeting approves the summaries proposed, with the additional amendment moved by Mr. Renevey.

He calls upon Mr. Dähnick to now read the summary referring to goods wagons.

Mr. Bals asks whether the brakesman's cabin of goods wagons continues to be made of wood.

Messrs. Mariani and Renevey answer in the affirmative. The construction of metal brakesman's cabins offering efficient security would lead to an inacceptable increase in weight. Besides, in view of the continuous brake becoming more and more general, the matter is of secondary importance.

Mr. Renevey expresses the opinion that article 5 of the summary referring to the advantages of the use of copper-bearing steels is too categorical.

Mr. Mariani thinks that it is necessary to maintain the contents of Summary 1 referring to the greater security of all-metal wagons.

After an observation made by Mr. Bals, Mr. Mariani proposes to strike out the word « open » in the second line of article 1.

Mr. Vandersypen (*Belgian National Ry. Co.*) says that the experiments that have been made on the Belgian National Railways, of covering wagons with zinc, have given good results.

Mr. Bloch points out the advantages obtained by assembling thin plates by « butt » welding.

Mr. Dähnick, replying to an observation made by Mr. Renevey, says that the German Railways have used so far lead

minium as a protection against rust, but that the use of this material creates certain difficulties with the workmen.

Mr. GRESLEY, coming back to the question of the use of copper-bearing steel, expresses the opinion that no proof has been furnished that this metal affords an efficient protection against rust. He adds that in England, wood or wrought-iron are used for the construction of coal trucks.

After an exchange of views on that subject amongst Messrs. GRESLEY, RENEVEY, Sir HENRY FOWLER, Messrs. DUCHATEL and DÄHNICK it is decided to adopt the following wording for No. 5 of the summary :

« The use of iron, of appropriate qualities of steel and of copper-bearing steel appears to be an improvement in the way of protection against corrosion. »

After an observation, presented by Mr. MARIANI, it is also decided to delete in article 2 of the summary, the words: « in which only the underframe is all-steel. »

THE PRESIDENT notes that there is general agreement concerning the summaries; he thanks the Special Reporter and the other Reporters for the excellent work done. Thereupon he declares that the work of the Second Section is over and expresses his best thanks to the Members and to the Officers of the section.

Sir HENRY FOWLER, in the name of the Members of the Section, thanks the President for the remarkable way in which he has conducted the deliberations. *(Applause.)*

Summary.

« A. — *Passenger carriages.*

« 1. The favourable results obtained « during the last three years with all-« metal passenger coaches confirm the « summary of the Madrid Congress, « wherein the following special advan-« tages were emphasized :

« Greater safety in case of accident;

« Favourable tare weight of the ve-« hicles;

« Possibility of mass production;

« Good interior appearance and ar-« rangement.

« 2. Results so far obtained appear to « authorise favourable expectations as « regards the life of the vehicles, main-« tenance costs and redemption of the « original capital cost. They justify the « expectation that all-metal carriages will « prove themselves and produce definite « savings, especially in those countries « in which the conditions for their use « are most favourable.

« 3. The method of construction in « which the underframe and the body « framing are built as one unit which « absorbs the forces developed as a « whole, the weight being reduced at « the same time, has given further satis-« faction. In all-metal construction this « method is used almost exclusively. « Experience has shown that it is neces-« sary to give special attention to the « strengthening of the ends of the car-« riages, in order that, in case of colli-« sion or overriding, they should offer « the greatest possible resistance.

« 4. By the use of high-grade steels « and by the substitution of welding for « riveting, appreciable savings in weight, « as compared with wood or riveted steel « carriages, can be effected.

« 5. The use of light metals and alloys « can also reduce the weight appreciably « and therefore offers advantages in cer-« tain structural parts under specified

« conditions, in spite of their high price. « Conclusive evidence as to their behaviour over a long period of time is not « yet available. The Congress recommends the use of these materials to be « further investigated.

« B. — *Goods wagons.*

« 1. Metal construction has special advantages over wood for goods wagons :

« Greater strength;
« Greater safety in service;
« Longer life;
« Lower maintenance costs.

« 2. Under given climatic and operating conditions covered goods wagons, « whether of the all-steel type or of composite construction, are used successfully.

« 3. All-steel construction for special « coal, coke, and mineral wagons is advantageous.

« 4. By substituting welding for riveting, appreciable reductions in weight « can be effected.

« 5. The use of iron or of steels of « appropriate qualities and of copper-bearing steel appears to be an improvement in the way of protection against « corrosion. »

3rd SECTION. — Working.

President : M. Margot.
Vice-Presidents : E. Seefehlner, M. Yoyitch and E. Savary.
Principal Secretary : E. Minsart.

QUESTION VII.

Allocation of freight rolling stock. Investigation into the turn-round of goods vehicles. Separation of the elements included in it. Methods of reducing the period of turn-round.

Preliminary documents.

1st report (Germany, Denmark, Finland, Great Britain, Dominions and Colonies, Sweden, America, China, Japan, Norway, Netherlands and Colonies), by Mr. W. F. H. van Rijckevorsel. (See *Bulletin*, May 1932, p. 609, or separate issue No. 5.)

2nd report (Belgium, Spain, France, Italy, Portugal and their Colonies, Luxemburg and Switzerland), by Mr. O. Gaeremynck. (See *Bulletin*, July 1932, p. 1259, or separate issue No. 19.)

3rd report (other countries), by Mr. J. Dolinar. (See *Bulletin*, October 1932, p. 1911, or separate issue No. 31.)

Special Reporter : Mr. W. F. H. van Rijckevorsel. (See *Bulletin*, January 1933, p. 83.)

Report of Section III.

(See *Daily Journal of the session*, No. 2, p. 5, and No. 5, p. 4.)

Meeting held on the 20 January 1933.

The President calls on Mr. van Rijckevorsel (*Special Reporter*) who reads the Summary of his report and The President invites a general discussion.

Mr. Tuz (*Polish State Rys.*), draws attention to the necessity for preparing in advance a monthly programme for allocation of rolling stock, especially on the greater systems, this programme being based on the statistics supplied from previous periods. This system has produced interesting results in Poland. Mr. Tuz presents a note which will be taken into account in the summary.

Mr. Stäckel (*Deutsche Reichsbahn*) observes that article 1*b* of the summary of the Special Reporter is only applicable where rolling stock is abundant. He asks if this article could not be modified by the following wording :

« *b*) To assure the supply of wagons to ports, industrial centres and markets in such a manner that the senders shall obtain the necessary wagons without the necessity for previous requisition. »

The Special Reporter agrees to this proposal.

Mr. Direz (*French State Rys.*) indicates that the problem of allocation is very complex, notwithstanding that all the great systems tend to adopt analogous solutions. He draws special attention to the importance of scientific organisation of allocation in the numerous cases where the constancy of the traffic needs allows

of the elaboration of a programme of allocation of a permanent character for great flows of empty wagons, and of changeable orders for the number to be allocated with organisation of trains offering quick routing.

Mr. DIREZ remarks that the telephonic improvements, particularly the dispatching system, can be utilised for the rapid circulation of direct trains. He adds that the standardisation of types of wagons should reduce the running of empty rolling stock, at the same time accelerating the turn-round.

Finally Mr. DIREZ sets out the exceptional methods that appear appropriate to him to anticipate seasonal or occasional requirements.

THE PRESIDENT, after having thanked Mr. DIREZ for his statement and having summarized it, proposes to the Meeting to condense in the summary the most interesting points which have arisen out of the reports.

Mr. VAN RIJCKEVORSEL (*Special Reporter*) raises no objection to this method.

Mr. TUZ proposes the following addition (*f*) to the summary of the special report, point 3 :

« *f*) On the great systems it appears to be desirable to prepare periodically a programme of allocation of wagons in accordance with anticipated service, applying a coefficient of rotation calculated in accordance with statistical observations. For this calculation it is sufficient to apply the most simple formulæ. The coefficient of rotation as well as the average delay of a wagon in each station should be regularly controlled. »

On the suggestion of THE PRESIDENT, Mr. DIREZ reads a new wording for the general summary, with which Mr. VAN RIJCKEVORSEL expresses his approval.

Mr. APOSTOLESCO (*Rumanian Railways*) states that in his opinion it would be desirable to discriminate in the calculation of the coefficient of rotation — a coefficient which is essentially dependent on the average distance of transport — so as to determine separately the time the wagons remain stationary and the time they are in circulation. The relative value of these two coefficients having been found, a formula would be obtained which could be recommended to all Administrations. This does not call for special forms accompanying the wagons.

Mr. GAEREMYNCK (*Reporter*) remarks that the distance of transport is of relatively small importance; it is the number of calls which specially matters. This point gives rise to a discussion between Messrs. DIREZ, TUZ and THE PRESIDENT, from which is deduced the utility of controlling rotation and delay in the big stations.

Mr. STÄCKEL draws attention to the interest there is in attaching the allocation of rolling stock to the Train Control Department.

Mr. SAVARY (*Swiss Federal Railways*) points out the necessity of introducing in the question of accelerated trains run by reason of exceptional traffic, reference to locomotive power available, in order that the arrangements made in this direction may not render the necessary locomotive power insufficient.

— These remarks will be taken into account in drawing up the general summary.

THE PRESIDENT sums them up and obtains the agreement of all to adopt an

additional paragraph to be inserted at the end of the summary given herunder.

Mr. Gaeremynck points out that the relative constancy of traffic requirements presents itself in many cases. Besides, in regard to the summaries Nos. 1*f*) and 2*e*), he states that sometimes the adjustment of rates proposed by the Commercial Departments has an unfavourable influence on the allocation of wagons and that particularly a reduced tariff should never be subordinated to the supply of a special type of wagon by the railway.

The President and Mr. Direz express their agreement.

Mr. Mermont (*French Est Ry.*), referring to the present situation, points out the advantage there be in not systematically stabling surplus wagons. He recommends to stable special types of wagons at stations where such types are likely to be used.

The President, while confirming Mr. Gaeremynck's remarks and those of Mr. Mermont, suggests that they should not be inserted in the general summary.

— The Section then approves the summary, which is subsequently ratified by the Plenary Meeting held on the 24 January; the 3rd paragraph was however slightly amended, the words « In the numerous cases in which this constancy *has been* noticed » being replaced by « In the numerous cases in which this constancy *is* noticed. »

Summary.

« The reports presented to the Congress in respect of the allocation of goods wagons show that in a general way the Railway Systems are inclined towards the same solutions, with certain peculiarities depending on the traffic requirements.

« What is interesting in the matter is the tendency towards a scientific organisation of the allocation with the object of reducing the period of turn-round of wagons and of increasing the efficiency of the available stock.

« In this order of ideas, advantage can be taken of the relative constancy of the traffic needs and the supply of wagons. In the large number of cases in which this constancy is noticed, it is possible to set up a system of allocation comprising permanent orders for the direction of currents of empty wagons, supplemented in view of important supplies by other orders varying in accordance with the traffic requirements. Such a plan should embody an appropriate organisation of a train service allowing as speedy a despatch of wagons as possible, while serving at the same time the stations with intense traffic at suitable hours for delivery and collection of wagons.

« The formula for centre-stations recommended in the summary of Question VIII regarding the grouping of parcels comes within the scope of this organisation of through trains.

« The improvements made in the telephone service in the form of « dispatching systems » can be used with advantage for the rapid circulation of through trains of empty and loaded wagons.

« Standardisation of the types of wagons, towards which the efforts of the Railways are directed, tends to simplify the operations necessary for the allocation of wagons, and to reduce the empty running and consequently to decrease the period of the turn-round of wagons.

« In case of heavy traffic due to « seasonal or exceptional requirements, « the quickness of the turn-round may « call for exceptional measures, such as « the formation of through trains accel- « erated as necessary, taking into con- « sideration the available locomotive « power, the despatch of empty wagons « by the quickest way by giving them « priority, and the increase of shunting « facilities at the stations.

« In view of the importance of the « quick turn-round of wagons, it is re- « commended, on the one hand, that the « allocation of wagons should be linked « to the service in charge of the goods « train running and, on the other hand, « a permanent control should be exer- « cised on the way the allocation pro- « grammes are carried out, or on the « operations at stations with intense traf- « fic, in order to constantly improve the « efficiency of the rolling stock. »

QUESTION VIII.

Organisation for carrying small consignments of goods and the most suitable methods for their delivery with the least delay. Use and selection of fixed and mechanical transhipping plants.

Preliminary documents.

1st report (Belgium, France, Spain, Holland, Portugal and their Colonies, Switzerland, Denmark, Finland, Luxemburg, Norway and Sweden), by Messrs. HAUTERRE and MERMONT. (See *Bulletin*, June 1932, p. 907 or separate issue No. 13.)

2nd report (all countries except America, Great Britain, Dominions and Colonies, China, Japan, Belgium, France, Spain, Holland, Portugal and their Colonies, Switzerland, Finland, Luxemburg, Norway and Sweden), by Mr. C. FETTARAPPA. (See *Bulletin*, May 1932, p. 621, or separate issue No. 6.)

3rd report (America, Great Britain, Dominions and Colonies, China and Japan), by Mr. E. MINSART. (See *Bulletin*, September 1932, p. 1777, or separate issue No. 27.)

Special Reporter : Mr. HAUTERRE. (See *Bulletin*, January 1933, p. 93.)

Report of Section III.

(See *Daily Journal of the Session*, No. 3, p. 7, and No. 5, p. 4.)

Meeting held on the 21 January 1933.

The Session opened at 9.30 a.m..

On the invitation of THE PRESIDENT, Mr. HAUTERRE (*Special Reporter*), reads the summary of his report.

THE PRESIDENT proposes to adopt the same procedure in the discussion as on the previous day, consisting in first of all examining the remarks that might be made by the Delegates in regard to the summary of the sepcial report, and thereafter prepare a résumé on the basis of the most interesting observations arising out of the reports presented. This proposal is approved.

Mr. FETTARAPPA (*Reporter*) suggests that special notice should be taken of the advantage of facilitating the exchange of packages between the different stations in one town by means of lorries in preference to wagons.

THE PRESIDENT considers this an interesting suggestion and that it should be made the subject of an additional paragraph to follow paragraph (*a*) (p. 116) of the summary of the special report. This new addition is worded as follows :

« (*b*) To facilitate the exchange of pack-

ages between the different local stations of a large town it is recommended that motor lorries should be substituted for the railway wagons, the transfer of which from station to station is particularly laborious. »

Paragraph (*b*) of the special report therefore becomes paragraph (*c*).

Mr. MINSART (*Reporter*) reminds the Meeting that he has mentioned in his report that an Irish railway already has an organisation working on the central-station plan, the introduction of which is considered in the summary of the special report. This is a service which is actually in operation and which will be progressively extended.

Mr. SAVARY (*Swiss Federal Railways*) refers to similar services working in Switzerland.

Mr. TUZ (*Polish State Railways*) states that the Polish Railways have obtained good results in granting premiums to the agents in charge of the make-up of direct wagons. He considers that this method should be recommended.

Mr. GAEREMYNCK (*Belgian National Ry. Co.*) points out in respect to framing railway transport rates that it would be dangerous to base such rates on road transport working costs which, as is known, are vitiated by the absence of certain charges incumbent on the railways.

Mr. SOMMIER (*Somain to Anzin and Belgian frontier Ry.*) remarks how difficult it is to base railway rates on the road rates : in fact many road carriers are not aware of their real working expenses and carry on at a loss.

THE PRESIDENT suggests that the remarks made may be considered as a useful supplement to the special report of Mr. HAUTERRE. This latter is therefore approved with the corresponding additions, and the first part of the discussion is closed.

THE PRESIDENT now proposes the examination of the new wording of the general summary.

Mr. HAUTERRE (*Special Reporter*) presents comments on these new conclusions, which the President sums up as follows :

« The result from the special reports and the discussions thereon, is a general agreement on the necessity for improving the parcels transport traffic, which is threatened by road competition.

« As a solution it is advisable to retain the running of light trains, as is done in Germany (« Leichte Stuckgüterzüge ») and on the Italian State Railways (« Treni rapidi collettame »), the creation of centre-stations in substitution for the several small stations which will permit of the grouping of parcels and accelerating their transport, the running of rail motor vehicles or locotractors for the transport of traffic from the small stations to the centre-stations, or vice-versa; making use of motor cars for door to door transport in connection with the transport service by rail and finally the use of containers in case of a tonnage inferior to a wagon load, especially in international traffic.

« It is necessary to attach special importance to the supplementary road transport service, to carefully organise the collection from sender's door, to increase the number of town receiving offices in the important centres, to simplify the rates for cartage in order to allow the public to find out without a long search the amount they will have to pay. It is also advisable to improve the tariff for the transport of parcels, and in this order of

ideas mention can be made of making a tariff per wagon-kilometre, as suggested by the French Railways, which will be applied to wagons hired by the senders; this kind of tariff will have the effect of inducing the hirers to utilise to the best advantage the wagons they have hired and particularly to find return freight.

Finally it would be well to make the railway staff influence the public to regain traffic for the railway. »

At the request of THE PRESIDENT, Mr. SAVARY gives some information on the special parcels transport service known as the « ASTO » system. This system which provides close collaboration with road transport has been on trial in Switzerland for the last year on the Zurich-Romanshorn line.

In view of the interesting results which have been obtained, the Swiss Federal Railways have extended the experiment to the Geneva-Lausanne line where traffic conditions are different. In reply to a remark made by Mr. GAEREMYNCK, Mr. SAVARY states that the carriage of parcels from centre-station to centre-station is by rail, only in exceptional cases by road.

Mr. VAN RIJCKEVORSEL (*Netherlands Railways*) points out, in the same connection, that there exists in Holland a Company named A.T.O. whose shares are all held by the Netherlands Railways, and which carries door-to-door traffic, transported by rail, road, or local waterways. This organisation, which has been working for more than four years, has given excellent results and seems so be worthy of recommendation.

THE PRESIDENT finally points out that in France and in America motor cars have replaced trains totally or partly on certain secondary lines.

The discussion having been completed, THE PRESIDENT calls for the reading of the following general summary, which is approved.

Summary.

« The reports presented to the Congress on the subject of the organisation of parcels transport bring to light the efforts made by the Railway Companies towards a better service of ordinary and fast goods transport with the object of improvements called for by the necessity for retaining this traffic, which is being strongly disputed by automobile competition.

« Many points arise out of the various measures taken or suggestions put forward in respect of rail transport, and complementary transport from the premises of the sender to the despatching station and from the arrival station to the consignee's premises.

« First of all, for the rapid transport of parcels by rail must be borne in mind the solution by the employment of light trains, inaugurated on the Deutsche Reichsbahn under the title of *Leichte Stückgüterzüge* and known on the Italian State Railways as *Treni rapidi collettame.*

« Alternately, it may be advantageous to substitute for the multitude of despatching and receiving stations a limited number of centre-stations, commanding operating zones of some extent and constituting principal points of departure and arrival for rail borne parcels traffic, the connections between the centre-stations being maintained by rail.

« The object is to group the elements for making up full wagons or groups, the transport of which must be effected rapidly. The concentration of packages at the centre-station or the dis-

« tribution at the secondary stations may « be carried out either by road lorries or « by rail cars designed in such a way as « to provide economical transport, or « even by means of a simple shunting en- « gine, e. g. a loco-tractor.

« In regard to complementary trans- « port, it is essential that the railway « endeavours to realise, as far as lies « in its power, the convenience that the « automobile service offers to the public, « especially door-to-door transport.

« The use of containers for groups of « packages, which cannot fully load a « wagon, has constituted an improve- « ment; this should be followed up and « extended, especially in international « traffic.

« For single packages, the system « should be developed of collection at « private houses and at receiving offices, « the number of which should be in- « creased in the big towns. This pro- « gramme may be be carried out either « by Express Companies making use of « the railway or by the Railways them- « selves, by means of lorries equipped in « an up-to-date manner, in order to meet « the demand for greatest rapidity both « in transport to the station and delivery « on arrival.

« In this respect it is useful to unify, « on any one System, the scale of cartage « charges, with a view to facilitating the « task of the public, always worried by « the complication of documents.

« With the same object in view, it may « be advantageous to look for new for- « mulæ for rate making, based on the « practice of the automobile services. « For example, when hiring to Express « Companies, Factories, or Merchants, « wagons to be transported, whether full « or empty, on a kilometric basis, the « senders would come to prefer the use « of wagon and rail transport to trans- « port by lorry. The Express Company « would have a representative in charge « of the distribution of the packages to « the consignees, and would, moreover, « be induced to canvass for return « freight.

« To sum up, every means should be « employed to enable the railway to ren- « der the services that the automobile « offers to the public, not only by mo- « dernising its methods but also by en- « couraging its employees to influence « the public in such a manner as to re- « tain and secure traffic and to direct « the minds towards a more exact com- « prehension of the general economy. »

— This summary was ratified by the Plenary Meeting held on the 24 January.

QUESTION IX.

Automatic train control and train stop. Track equipment. Locomotive fittings. Methods used for repeating signals on the locomotives. Devices intended to ensure the attention of the drivers.

Preliminary documents.

1st report (All countries except America, Great Britain, Dominions and Colonies, China, Japan, Belgium, Spain, France, Italy, Netherlands, Portugal and their Colonies, Denmark, Finland, Luxemburg, Norway and Sweden), by Mr. W. Stäckel. (See *Bulletin*, May 1932, p. 811, or separate issue No. 11.)

2nd report (America, Great Britain, Dominions and Colonies, China and Japan), by Mr. G. H. Crook. (See *Bulletin*, May 1932, p. 705, or separate issue No. 8.)

3rd report (Belgium, Spain, France, Italy, Netherlands, Portugal and their Colonies, Denmark, Finland, Luxemburg, Norway, Sweden and Switzerland), by

Mr. V. Vlaikoff. (See *Bulletin* October 1932, p. 2023, or separate issue No. 33.)

Special Reporter : Mr. W. Stäckel. (See *Bulletin*, January 1933, p. 118.)

Report of Sections II and III combined.

(See *Daily Journal of the session*, No. 4, p. 4, No. 7, p. 4, and No. 8, p. 2.)

Meeting held on the 23 January 1933.

The Meeting opens at 9.30, Mr. Margot (*President of the 3rd Section*) being in the Chair.

Mr. Stäckel (*Special Reporter*) before reading the summary of his special report, makes a general remark. The apparatus in use, which either effect the simple repetition of signals on the locomotive, or cause the brakes to be applied, are not very different, and in Germany they are all classified under the one title of « Zugbeeinflussung » (train control).

Mr. Stäckel thereupon reads the summary of his report.

The President thanks Mr. Stäckel for his very interesting report. He then invites a general discussion, indicating that the final conclusions to be arrived at and which the Section would be asked to approve, would be prepared on the basis of the opinions offered. (*Approved.*)

Lt. Colonel Mount (*Ministry of Transport, England*) recalls that the study of this question has, in England, been referred to a Government Committee, the « Automatic Train Control Committee ». This Committee has established the difference between the « direct » method, which consists in employing special apparatus for repeating signals on the locomotives and possibly acting on the brakes, and, on the other hand, the « indirect » method, which consists in improving the existing signalling system. Referring to a passage of the Special report (p. 118 of the English text) relating to the reserved attitude adopted in the matter of automatic train control by the countries where accidents due to overrunning signals are rare, the speaker draws attention to the fact that in England there are few accidents but, nevertheless, the English Railway Companies attach great importance to automatic train control. The Great Western Railway has applied it extensively; two other systems, the Southern and the London Midland and Scottish Railways are making experiments on several sections.

In England it is the opinion that fixed permanent way signals should be retained together with the automatic train control.

In regard to the objection based on a possible interruption of current provoked by hoar-frost, this does not apply on the Great Western System which works on the closed-circuit principle, so that an interruption of current acts in the direction of safety.

Lt. Col. Mount draws attention to an important difference in the percentage of failures mentioned in the report of Mr. Vlaïkoff (1.5 per cent for the Paris-Orleans and 2 per thousand for the Paris-Lyons-Mediterranean). The speaker considers that these figures must be erroneous.

In respect to vigilance control, Lt. Col. Mount remarks that it is not correct that drivers, relying on the automatic control, pay less attention to the signals. It is apparent, on the contrary, that they are very glad of the additional information and safety which the automatic control gives them.

The President remarks that Lt. Col.

Mount expresses himself in favour of automatic train control, an that it is a question of principle really covering two different questions : repetition of signals on the locomotive and automatic control of brakes. He asks the Delegates to express their opinions on the two questions.

Mr. Duchatel (*French Est Railways*), states that there is indeed a very clear distinction to be made between the simple repetition of signals on the locomotive, and the apparatus acting automatically on the brakes.

The driver has three things to do : he has to observe clearly the signals, transform his observations into conception of the action to be taken, and carry out the action. It is in the correct observation of the signals that lies the principal risk and in France, by acoustic repetition of the signals completed by vigilance control, excellent results have been obtained. The risk of seeing a driver, who has correctly observed the indications of the track signals, not take the corresponding measures, is very slight. Consequently, automatic train control does not supply any appreciable additional safety. On the other hand, automatic train control is only efficacious when the distance between the trains is such that there are always two signals between two trains, and provided the distance of the two signals is equal to the stopping distance of all trains, which is exceptional. In the most frequent cases, where the trains have different braking distances, there is a risk of stopping fast trains too late or slow trains too soon.

Mr. Duchatel concludes that under normal working conditions, with trains running at different speeds and having different means of braking, the automatic repetition of signals on the locomotive gives sufficient guarantee of safety, and that the superimposition of the automatic control of the brakes does not present such a degree of usefulness as to justify the high cost involved.

Mr. Stäckel remarks that the case of the unconsciousness of the driver between the moment when he sees the distant signal and the moment when he nears the stopping signal must be taken into account. Mr. Duchatel's remarks do not appear to refer to the use that has been made of the automatic action on the brakes. This is only conditional, should the driver have failed to act on the vigilance lever, or when speed is excessive.

Mr. Gresley (*London & North Eastern Ry.*) remarks that with the apparatus of the Great Western, the additional expense for obtaining the automatic stop is insignificant because the accoustic signal is obtained by action of the air and the brakes can be acted on at the same time. It is considered in England that it is desirable to partially apply the brakes at the distant signal.

Mr. Savary (*Swiss Federal Railways*), does not agree with the thesis of Mr. Duchatel, and considers, on the contrary, that automatic control of the brakes constitutes progress. He does not insist on the objection of the necessary connection between the distance of the distant and stop signals and the braking length, thinking that this objection will lose its value with the extension of day-light signalling.

On the electric traction lines, at present only one man is employed for driving, with the « dead man's » safety device which it is very easy to combine with the automatic stop. The advantage of having

only one man for driving an electric locomotive is such as to justify the expense of installing the apparatus on the line and the tendency should be in this direction by closely controlling the vigilance of the driver.

Mr. DUCHATEL agrees that the position of electrically operated lines is special and that in his statement he was only taking into consideration steam traction lines. In reply to the observations of Messrs. STÄCKEL and GRESLEY, he repeats that in making the repetition of signals on the locomotive, the most important risk has been done away with, and that the automatic control apparatus, being very costly, only supplies a slightly appreciable additional safety, at the same time introducing into the working, difficulties which may prove a new source of danger.

Mr. STÄCKEL states that in Germany they have not passed through the stage of audible repetition of signals on the locomotive and that it has not been considered opportune, for psychological reasons, to introduce a severe control on the vigilance of the driver. The action on the brake does not take place until after passing the distant signal, if the driver has not taken the necessary measures, in which case it is necessary to obtain action on the brakes with all urgency.

Mr. CHALK (*North West Railway, India*), informs the Meeting that on his railway there were three men on the locomotive, of which one is a coal breaker, but the driver is the only one responsible for driving the train.

Replying to a question of Mr. VALLANTIN (*Paris-Lyons-Mediterrannean Rys., France*), Mr. GRESLEY states that a railway in England (Great Western) has extensively applied the automatic train control, but that other systems, amongst which the Southern and the London Midland and Scottish, are trying the Hudd system on some sections of their lines.

THE PRESIDENT sums up the views put forward. There is, on the one side, the opinion put forward by the Special Reporter, based on the situation existing in Germany where they have passed in a moment to the complete system of automatic train control without making use of the audible repetition of signals nor the severe control of the vigilance. On the other side, there is the thesis of Mr. DUCHATEL according to which the acoustic repetition of signals does away with the most important risk, the automatic stop being therefore useless and capable of introducing new risks. Finally there is the English solution which combines the repetition of signals and the automatic control of trains, no supplementary expenses being incurred for the latter.

THE PRESIDENT proposes to the Section that the Bureau should undertake to draw up the final summary, taking into account the different opinions that have been expressed, which summary will be presented to the Section at a special meeting to be held on the following day.

This proposal is agreed.

The Meeting adjourns at 11.50 a.m.

Meeting held on the 24 January 1933.

The Meeting opens at 11.30 a.m., Mr. MARGOT being in the Chair.

THE PRESIDENT informs the Meeting that the Bureau of the Section has prepared, in collaboration with the Special Reporter and other Delegates who took part in the discussion, a new text for the summary, embodying the views that

have been put forward. This new text endeavours to deal with the delicate question of the superimposition of automatic train stop on the simple repetition of signals, some delegates preferring to limit themselves to simple acoustic repetition.

The President then reads the new text, which is as follows :

New (proposed) Summary of Question IX.

« Transmission of signals to the locomotive constitutes an important additional measure of safety. The installation is recommended when this additional safety precaution (consideration being given to the speed of the trains, intensity of the traffic and the frequency of the signals) justifies the cost of the installation.

« This transmission can be utilised for a simple acoustic or visual repetition of signals, leaving it to the driver to take the necessary action to stop or slow up, or for automatic control, immediate or deferred, of the brake apparatus of the locomotive.

« In any case, the maintenance of safety must, as in the past, depend on the vigilance of the driver, and it is necessary that care be taken so that this vigilance does not run the risk of becoming blunted.

« For this same reason it is generally advisable not to remove the fixed signals from the permanent way.

« On the lines that have not yet equipped for the acoustic repetition of signals, the automatic brake control of the locomotive may give a certain additional measure of safety, if it does not otherwise produce, from the point of view of the traffic, difficulties capable of causing risks to arise, at least as great as those which it is proposed to suppress.

« It would be well, on the other hand, that the expense incurred for this purpose should not be out of proportion to the result likely to be obtained.

« Continuous connection between the road and the locomotive seems, in principle, to be preferable to intermittent connection. However, intermittent connection, alone, gives sufficient safety, so that recourse to continuous connection should not be resorted to if complications or additional expenses of any magnitude are likely to arise. »

Lt. Colonel Mount remarks that he has indicated on the previous day that he is in agreement with the summary of the Special Reporter, subject to a slight modification of paragraph 9. The new text does not appear to him to be an improvement on the wording of the Special Reporter.

Mr. Gresley observes that the question at issue was to know whether the automatic train stop should be added to the repetition of signals so as to provide an important additional element of safety. Experience in England enables him to reply to this question in the affirmative. The new text seems to attach more importance to the cost of installation than the summary of the Special Reporter. In conclusion, Mr. Gresley moves the adoption of the text prepared by the Special Reporter, subject to a slight modification of paragraph 9.

Mr. Tevfik Fazli (*Turkish State*), states that on his system there is neither any system of cab signals nor automatic train stop in use. He regrets that the discussions have not enabled him to learn the solution to adopt in the different cases.

Mr. Avery (*North Western Railway, India*), draws attention to the necessity

for protecting a train stationary in front of a stop signal.

Lt. Col. Mount is of opinion that the relative value of the two systems is well set out in Paragraph 13 of the summary of the Special Reporter, and he proposes, with Mr. Gresley, to revert to the text of the Special Reporter.

Mr. Bals (*Rumanian Railways*), propose also to keep to the summary of the Special Reporter, whilst modifying paragraph 2.

The President proposes to adjourn the discussion until the next meeting.

Mr. Duchatel states that it is not possible to exhaust the subject. The Meeting will have to separate without arriving at a conclusion or to adopt the summary prepared by the Bureau of the Section.

Mr. Gresley remarks that the Delegates have had time to study the summary of the Special Reporter, which is not the case with the new text. He asks that a vote be taken, not on the new text, but on the summary of the Special Reporter.

Sir Henry Fowler (*London Midland and Scottish Railway*) supports the proposal of Mr. Gresley for a vote to be taken on the summary of the Special Reporter.

After a discussion on the procedure to be followed, the closure of the discussion is put to the vote. This does not receive the necessary two-third majority vote and is therefore rejected.

The President announces that the next meeting will take place the following day at 3 p.m.

Meeting held on the 26 January 1933.

The Meeting opens at 11.30 a.m. under the presidency of Mr. Margot.

The President points out that in view of the discussion at the meeting of the 24 January, it has been found desirable to retain the summary prepared by the Special Reporter and to amend it so as to embody the remarks made by some of the Members.

The President presents to the Meeting a text drawn up by the Special Reporter, Mr. Gresley, Lt. Col. Mount and Mr. de Boysson (*Paris-Orleans Rys.*) in collaboration.

— The text is read in three languages.

Mr. Vlaikoff (*Reporter*) asks the Meeting to guard against the proposals of the inventors of systems having direct bearing on the safety of trains. He is of the opinion that the Railway Administrations should see that no experiment is made without the guarantee of a competent Authority.

The President, while recognizing that this remark is well founded, considers that it cannot be inserted in the summary and decides, in agreement with the Delegate, to include it in the proceedings.

Finally, the following summary is approved :

Summary.

« 1. The desirability of equipping a « railway system or individual lines with « train control apparatus depends « amongst other things upon the train « speed, the intensity of the traffic, the « interval between signals and the cost « of installation.

« Automatic train control is an im« portant complement to the safety pre« cautions. Its introduction is recom« mended on routes where it appears « necessary in the light of the above « considerations.

« 2. Train control can be effected in « two ways :

« *a*) By a simple repetition of the « signals on the engine;

« *b*) By direct action on the brakes « to cause stoppage or reduction of speed.

« The two devices can be utilised « jointly.

« 3. In both cases train control should « be regarded as an adjunct to the exist- « ing signalling equipment. It is in- « tended to ensure the observance of « signals in all cases where the driver « fails to take notice of them, or to avoid « the consequences resulting from such « failures. But, in the main, safe run- « ning has to be guaranteed, as in the « past, by the alertness of the driver, « and it is important that this alertness « should not be interfered with. It is « therefore recommended in general not « to remove fixed signals on lines prov- « ided with automatic train control.

« 4. The continuous inductive system « of automatic control is capable of meet- « ing operating and safety requirements « to a somewhat greater extent than the « intermittent inductive system. Suffi- « cient information is not yet available « to form the basis of a decision as to « whether this advantage is or is not out- « weighed by the higher cost and greater « delicacy of the continuous system. « The most important operating and sa- « fety conditions can be met by the in- « termittent system. The continuous « system should be considered simply « in connection with lines equipped with « automatic signalling.

« 5. The purely mechanical method of « transmission has proved a reliable me- « thod of conveying intermittent im- « pulses from the track to the locomotive « on Metropolitan systems. Where snow « or other deposits on the track are « liable to cause disturbances, it is de- « sirable to arrange the transmitting ap- « paratus at a suitable height above rail « level. Difference of opinion exists as « to the suitability of the purely mechan- « ical system of transmission for fast « train routes.

« 6. The electro-mechanical system of « transmission using contact ramps has « given satisfatory results in countries « having temperate climates (Western « Europe); in some cases, however, pro- « tection has to be provided against hoar « frost. An essential condition for the « employment of the electro-mechanical « design is the existence of ample clear- « ance between the underside of the ve- « hicles and the track.

« 7. Various electro-inductive systems « have proved reliable and not sensitive « to climatic conditions on fast train « routes.

« 8. With the continuous inductive « automatic control, only inductive trans- « mission by track circuits can be con- « sidered at present.

« 9. An advantage of the electro-me- « chanical and the inductive types of « equipment, as compared to other de- « signs, is that they do not require any « operating gear on the track. In cer- « tain types of inductive equipment, it « has been possible to dispense with a « local supply of current.

« 10. The adoption of the closed cir- « cuit principle in such a way that any « failure would produce a warning in- « dication is to be preferred on grounds « of safety.

« 11. The chief object of automatic « train control is to stop the train if a « home signal is at danger. It is desir- « able to so design the equipment, that « safeguards can be applied to ensure

« reductions of speed at junctions and « other places where such restrictions « are stipulated. Systems which give « several kinds of impulses are specially « suitable for this requirement.

« 12. In cases of railway services in « which short braking distances are the « rule, the consequences of the driver « failing to comply with signals can be « fully averted by an automatic control « transmitter at the home signal, prov- « ided that the impulse causes the brakes « to be applied immediately, and that the « distance between the home signal and « the danger point is at least equal to « the full braking distance.

« As a rule these conditions are not « fulfilled on fast train routes; first of « all, therefore, an automatic control ac- « tion before reaching the stop signal is « essential in such cases.

« 13. In types in which action begins « before reaching the stop signal, a sim- « ple repetition of the signals on the « locomotive, together with the device « for checking the alertness of the driver, « and the recorder, can be considered « as sufficient. In this way the more « important factor of safety is secured « without interfering with the work of « the driver.

« 14. On railways which have not « adopted the preceding system, it is de- « sirable that the application of the « brakes shall also occur with automatic « control transmitters before reaching « the stop signal, in order to obviate the « possibility of the driver making a « mistake after passing the distant signal.

« Only when danger exists, however, « should braking be continued up to the « point of complete stoppage; contrari- « wise, when the driver is running ac- « cording to regulations, control of the « speed should remain in his hands.

« 15. For checking the alertness of the « driver, either a vigilance checking de- « vice, or an arrangement for graded « speed checks are available. The vigi- « lance check in the vicinity of the dis- « tant signal can be supplemented by a « speed check that comes into operation « later.

« 16. The vigilance checking device « must enable the driver to prevent the « brakes coming into operation in the « neighbourhood of a distant signal. It « may be an advantage, from the point « of view of maintaining smooth oper- « ation if, in addition, it is possible to « release the brakes subsequently. How- « ever, the alertness of the driver is bet- « ter guaranteed if braking continues to « the point of standstill, after he has « failed to apply the vigilance checking « device, and the release of the brakes « can only be effected when the train has « stopped.

« 17. With a view to maintaining pro- « per supervision over the use of the « vigilance checking device, and the « existence of the control impulses, it « is desirable that recording apparatus « should be fitted which should, if pos- « sible, record the speed and indicate the « location at which each event has oc- « curred.

« 18. Designs which embody uncon- « ditional braking at a danger signal re- « quire a cancelling-out device, so that « in the event of signal failures, it may « be possible to run past a signal which « is at danger.

« 19. It must be possible for the driver « to cut out the automatic control appar- « atus in the event of faults occurring « in the equipment on the engine. »

— This summary was ratified by the plenary Meeting held on the 30 January.

4th SECTION. — General.

President : Mahmoud Chaker Bey.
Vice-Presidents : H. B. Bovee, A. Wasiutynski, A. A. Lisboa de Lima, and Henning.
Principal Secretary : A. Allard.

QUESTION X.

Instances of the application in a railway department of the scientific organisation of work. Co-operation of the staff towards increased efficiency and its participation in the profits.

Preliminary documents.

1st report (Belgium, Spain, France and their Colonies, Great Britain, Dominions and Colonies, Luxemburg, Holland, Portugal and their Colonies), by Messrs. E. Soulez and M. Bloch. (See *Bulletin*, July 1932, p. 1329, or separate issue No. 21.)

2nd report (All countries except Spain, Portugal, France, Great Britain, Dominions and Colonies, Belgium, Luxemburg, Holland, Denmark, Norway, Sweden, Finland, Germany, Switzerland, Czechoslovakia, Bulgaria, Greece, Rumania, Jugoslavia, Turkey and Poland), by Messrs. L. Tosti and C. Valeri. (See *Bulletin*, July 1932, p. 1211, or separate issue No. 18.)

3rd report (Denmark, Norway, Sweden, Finland, Germany, Switzerland, Czechoslovakia, Bulgaria, Greece, Rumania, Jugoslavia, Turkey and Poland), by Messrs. Mereutza and Panaitopol. (See *Bulletin*, October 1932, p. 1923, or separate issue No. 32.)

Special Reporters : Messrs. E. Soulez and M. Bloch. (See *Bulletin*, January 1933, p. 132.)

Report of Section IV.

(See *Daily Journal of the Session*, No. 2, p. 6, No. 3, p. 8, No. 5, p. 4.)

Meeting held on the 20 January 1933.

The President calls on Mr. Soulez (*Special Reporter*).

Mr. Soulez draws attention to certain particular points which are the subject of his report :

a) The importance of the organisation of work in times of crisis;

b) Possible drawbacks of too large organisations;

c) Advantages of interpenetration of all services;

d) Improved efficiency obtained by the grouping of work in the minimum of well provided workshops;

e) Advantages resulting from the standardisation of parts;

f) Necessity for obtaining the maximum efficiency from the staff through its devotion to the common task.

Mahmoud Chaker Bey passes on the presidency to Mr. Henning.

The Meeting examines the conclusions drawn up by the Reporters.

Summary No. 1. — Mr. VANDERSYPEN (*Belgian Railways*) states that he attaches more importance to the internal organisation of railways than to external co-operation of different means of transport.

The summary arrived at is unanimously adopted.

Summaries Nos. 2, 3, 4, 5 and 6. — Unanimously adopted without discussion.

Summary No. 7. — This paragraph aims at the measures the administrations are led to take with a view to improving the education of their personnel.

At THE PRESIDENT'S request the delegates representing different Administrations give a few details on the organisations adopted on their railways : Messrs. SOULEZ and BLOCH (*Special Reporters*), Messrs. PANAITOPOL and VALERI (*Reporters*), Mr. AVERY (*North Western Railway, India*).

THE PRESIDENT summarises the speeches of the different speakers; a few administrations directly intervene in developing the general education of their collaborators; most of the time the measures taken, often very complete, aim only at the professional side of education in the largest sense of the word.

Summary No. 7 is unanimously adopted.

Summary No. 8 (Social work). — THE PRESIDENT divides the question into two parts : *a*) Medical service; *b*) other social work, particularly organisation of holidays and recreations.

The Meeting examines these two points successively.

With regard to the medical service, the information given by the different members who spoke can be summarised as follows: few administrations employ doctors forming part of their staff. Some railways call upon doctors attached to these undertakings, to which they however only devote part of their time. Other administrations choose a certain number of doctors to whom the staff present themselves for treatment.

One of the main reasons of the administrations is to reduce to a minimum the number of days of absence.

A discussion then ensues on this important point, between Messrs. SOULEZ, BLOCH, PANAITOPOL, AGUILAR LOPEZ (*Spanish Government*), LISBOA DE LIMA (*State Railways in the Portuguese Colonies, Vice-President of the Section*), CHIOSSI (*Italian State Railways*), ESTEVES, (*Portuguese Railway Company*) and WASIUTYNSKI (*Polish State Rys., Vice-President of the Section*).

Dealing subsequently with this social work, the Meeting examines in detail the organisations of different countries.

Some interesting information is given by the Reporters and by Mr. ESTEVES, and Mr. TEODOREANO (*Rumanian Rys.*)

Mr. CHIOSSI gives a very interesting and full account of the social work performed in Italy, particularly with regard to the « Dopolavoro ».

Summary 8 is unanimously adopted, after alterations in the wording.

Mr. AGUILAR LOPEZ remarks that the question of participation in the profits was not dealt with in the conclusions.

After exchanging views with the Reporters, THE PRESIDENT states that this question will be discussed at the next Meeting.

The Meeting is then closed.

Meeting held on the 21 January 1933.

The Meeting opened under the presidency of Mr. HENNING (*Vice-President*). The proceedings of the Meeting held on the 20 January are adopted without remarks, and the Meeting continues to examine the question dealing with the *participation of the staff in the profits.*

Sir HENRY FOWLER (*London Midland and Scottish Railway*) is of opinion that the participation of the staff in the profits is rather a general matter which does not particularly apply to railways.

THE PRESIDENT thinks that it should nevertheless be discussed.

Mr. HONDL (*Czechoslovakian State*) explains in detail the « contract » method adopted on his railway system. This method was put into force on the 1 April 1931 and the favourable results obtained thereby have led the administration to develop it progressively.

This method consists in interesting the staff in the savings effected : The difference between the actual expenses incurred and the pre-estimated cost is divided between the administration and the staff.

This information is the object of an exchange of views in which Messrs. AVERY, GOONETILLEKE (*Ceylon Government Railway*), WANG (*Chinese Government*), and THE PRESIDENT take part.

Mr. HONDL states that the information given was already discussed at the Congress of Scientific Organisation of Work, held at Amsterdam in 1932.

According to THE PRESIDENT'S request, the Meeting unanimously approves the addition of an article to the proposed summary. This article appears hereunder as No. 7.

The conclusions adopted by the Meeting are shown hereafter.

Mr. AGUILAR LOPEZ thanks THE PRESIDENT for the way in which he was able to carry out his duties and also thanked the Reporters for their clear and full accounts given on such an extensive matter.

THE PRESIDENT also thanks the Reporters personnally and on behalf of the Meeting.

— The Meeting was closed.

Summary.

« 1. At the base of rail transport organisation is the general organisation « of all means of transport, but to enable « each to cater for its own traffic, the « legal and fiscal obligations should be « the same for all carriers.

« This condition being fulfilled, the « harmonious co-ordination desired must « be sought for from the outside by effecting all possible connections between rail and other means of transport (road motors, mechanised inland « water transport, aeroplanes) and also « be pursued internally in each service, « system and group of systems, in order « to increase efficiency. It should be « noted, however, that amalgamation, to « which in certain cases co-ordination « may lead, is limited, both as regards « management and actual operation, by « various circumstances.

« 2. The results which it is hoped to « achieve from organisation not being « entirely dependent upon the railways « themselves, it is necessary if the efforts made are to have really satisfactory results, that the administrative « obligations to which the railways are « subjected and the regulations by

« which they are governed should be « properly adapted to the existing econ- « omic conditions and the increased « technical possibilities of new ap- « pliances.

« 3. The aim of modern organisation « should be to carry out all mechanical « work by machinery, leaving to the « human being those tasks which require « initiative and discernment.

« Such organisation increases the sa- « fety of the employees, both by the « abolition of certain work involving « special risk, and by the introduction « of devices which safeguard the oper- « atives against the consequences of hu- « man fallibility.

« Finally, the organisation of work « together with the award of output pre- « miums or shares in the general profits « of the undertaking makes it possible to « assure an increased remuneration to « the staff.

« 4. The duties of controlling offices « must be clearly defined and be sim- « plified as much as possible, with a « maximum of direct contact between « each other and between them and the « services under their direction so as to « expedite to the utmost all matters dealt « with.

« A means of ensuring inter-service « contact which can be recommended is « the holding of periodical meetings be- « tween officials responsible each of part « of a common task.

« 5. The operative services should be « enabled to collaborate in the endeavour « to discover more economical and re- « liable methods. In view of the satis- « factory results already obtained in this « connection, it would be desirable to « extend standardisation of stock as far « as possible, reducing the number of « types and standardising parts and the « tolerances allowed therefor.

« The various workshops and establish- « ments should be organised on the same « lines, adopting the principle of respons- « ible specialisation, whilst not curbing « the initiative of the staff. The organ- « isation of work presents a similar as- « pect for all railway systems, and it « might be of value for the railways « to interest themselves in the work of « the national and international bodies « in connection with scientific organ- « isation.

« In this respect it appears that the « improvements to be effected consist « in the first place in the simplifi- « cation of the operations themselves, « and secondly in the improvement of « the plant. Finally, a prime factor to « be kept in mind for the efficient or- « ganisation of work is the employment « of staff physically fit to perform their « alloted duties, and it is for this rea- « son that attention is drawn to the « development of the psycho-technical « examination already introduced by a « certain number of administrations.

« 6. The preceding measures concern- « ing the material conditions of the or- « ganisation and preparation of work « appear to require the addition of a « moral factor in the shape of the con- « fident collaboration of the staff, bring- « ing with it a spontaneous display of « collective good will, based on reciprocal « esteem and equitable remuneration ac- « cording to the efforts exerted and the « results obtained.

« It is considered that for determining « this remuneration, the premium sys- « tem, already made use of, should be « developed. Under this system, pay- « ment consists of two elements : one

« fixed and the other varying with the « quality and quantity of the work done.

« The premium should first be introduced at the base, that is for the elementary operations and be so applied « as to remunerate speedily the efforts « of each employee and in particular « the economies realised in regard to « time taken and material consumed, and « the general efficiency of each establishment.

« 7. From the reports it appears that « no administration strictly speaking « grants participation by its staff in the « benefits of the undertaking.

« Certain administrations distribute « among their employees sums calculated « on the general results of their working « or on economies realised. Some of « them consider that favourable results « can be anticipated from now onwards. « However, this scheme is very recent « and limited to a small number of administrations, and it is not yet possible to draw final conclusions on this « matter.

« 8. As brought out in the summaries « adopted by the Congress in 1930, in « connection with question XVI of its « agenda, it is necessary for railway employees to be well versed in their profession and also to have a good general « knowledge.

« Technical schools and educational « schemes of all kinds instituted by the « railways for the instruction of their « employees are therefore of first class « utility for the improvement of the « railways, and their importance should « not be underestimated.

« 9. For increasing the feeling of confidence and the security of the staff « it is desirable that social and welfare « work should be extended.

« These measures, which are outside « the scope of the actual employment, « are aimed at maintaining the physical « wellbeing of the employee and his family and assisting their material existence right down to the small detail. « They result in the staff being more « devoted to their work, more relieved of « daily cares, and can therefore be highly conducive to the attainment of improved efficiency of the railway system. »

QUESTION XI.

Competition between or joint working of railways and airways, or railways and roadways.

An investigation from the technical, commercial and contractual points of view.

Preliminary documents.

1st report (America, Great Britain, Dominions and Colonies, China and Japan), by Mr. C. Cox. (See *Bulletin*, May 1932, p. 729, or separate issue No. 9.)

2nd report (All other countries), by Messrs. F. P. Villamil and E. D'Ocon Cortes. (See *Bulletin*, November 1932, p. 2113, or separate issue No. 35.)

Special Reporter : Mr. E. C. Cox. (See *Bulletin*, January 1933, p. 150.)

Report of Sections III and IV combined.

(See *Daily Journal of the session*, No. 6, p. 4, No. 7, p. 6, and No. 8, p. 2.)

Meeting held on the 25 January 1933.

The Meeting is opened at 11.10 o'clock under the presidency of Mr. Margot, President of Section III.

The President regrets the absence of

Mr. Cox (*Special Reporter*) who is unable to leave England.

He points out to the Members of Sections III and IV, that Section V expressed wishes which should be taken into account (1).

Sir Evelyn Cecil (*Southern Railway, Great Britain*) sets out that his Railway has seriously taken up the question of automobile competition. He further states that :

The public should be made to understand that if railways are to be maintained, the answer to which question cannot be but in the affirmative, railways should be accorded justice, and not subsidies which are not asked for. In England a joint committee examined the question and made recommendations; but then partisans of the automobile transport made opposition. The Governments' duty is to have laws voted for, and equal charges established between, the means of transport, and this should be done quickly.

The speaker remarks the distinction established by Mr. Javary between the railways which would have been constructed and those which would not have been, had the automobiles existed. He recommends Mr. Javary's solution consisting in having express trains run on the main lines, and using automobile services in zones around important stations, closing small stations in order to reduce the staff.

The Southern Railway studied the question of the electrification of suburbs of large towns. Recently this Railway opened for traffic the electrified line from London to Brighton, and the results obtained are already encouraging.

The Southern Railway has also taken interests in automobile transport companies in order to co-ordinate the two means of transport.

The President thanks Sir Evelyn Cecil for the interesting information given and agrees to retain Mr. Javary's solution, adding thereto the use of the rail motor cars towards which all the railways are tending, as has been apparent in the discussion of question XIII.

Mr. Bravo (*North of Spain Rys.*) informs the Meeting that in Spain a committee composed of representatives from all interested centres has examined the question and has elaborated a bill which is actually submitted to Parliament.

This project contains three parts: 1) Regulation of concessions for road transport; 2) the question of co-ordination of the various means of transport; 3) the question of taxes. The speaker hopes that this bill may shortly be adopted by Parliament and will greatly improve the present situation.

In what actually concerns the question of charges, the project aims at establishing an equality as complete as possible between transport by rail and by road.

Mr. Ibl (*Czechoslovakian State*) supplies detailed information on legislation introduced in his country by a law of December 1932. The effect of this is that all road transport, whether passenger or goods, constituting a definite industry, is subject to the terms of a concession, and that the concession is not granted if the public need does not require it, if the condition of the roads does not allow it, and if the State Railway Administration has made use of the right of priority by the creation, on its own account, of a road service fulfilling the object of the concession applied for.

The concession is granted for a definite period (15 years).

(1) See p. 530 of this *Bulletin*.

The State Railway Administration and the Post, Telegraph and Telephone Services are heard by the Authorities at the enquiry held to consider the application for the concession. These two Administrations are not obliged to apply for a concession for road services that they may propose to create. Casual transport of merchandise, if it is carried on as a definite industry, is also subject to concession, but this is only given for a clearly defined area.

Heavy road passenger transport (by vehicles which carry more than eight passengers), which is run by private interests or even under the direction of the State Railways, is subject to a tax which falls on the passenger in the form of an increase in the fare and which is equivalent to the tax imposed on passengers on the railway.

For commercial transport of less than eight passengers per vehicle, the equivalent of the tax is converted into an annual fixed charge, varying in accordance with the power of the motor. With regard to goods transport by road, the tax, constituting in part only the equivalent of the tax imposed on rail transport, also takes the form of a fixed annual charge, specially variable in accordance with the capacity of the vehicles employed for this class of traffic.

In reply to a question by Mr. Henning, Mr. Ibl states that, in Czechoslovakia, private lorries, without being subject to a concession, are subject to a tax, lower than that of the transport companies, and, in addition, to the customary tax for using the road.

Mr. Goonetilleke (*Ceylon Government Railway*), asks whether road transport is regulated in regard to control of timetables, and working hours for the driving staff.

Some Delegates state that in France an eight-hour law exists, but as far as they know, this law is not always observed.

— The continuation of the discussion is postponed until the following day and the meeting adjourns at 12.10 o'clock.

Meeting held on the 26 January 1933.

The Meeting opens at 9.55 a.m., Mr. Margot being in the Chair.

Mr. Esteves (*Portuguese Railway Company*) states that in Portugal a committee, formed for the purpose of studying the question, has presented a report embodying the following principles :

Public road motor transport undertakings are subject to Government authorisation with obligations very clearly defined in regard to minimum term of concession, securities to be found by the undertaking and, in general, the regularity and safety of transport.

For the concession of automobile transport services, the lines are classed in two categories : 1) lines competing with the railways; 2) feeder lines. The services under the first category are subject to the same working conditions as the railways; for those of the second category the conditions of the concession are more favourable and even contemplate, in certain cases, a subsidy from the State.

Mr. Ottone (*Confederazione Nazionale Fascista dei Trasporti Terristri e delle Navigazione interna*) supplies information in regard to a decree recently published in Italy in regard to secondary railways.

There are, particularly, three points to bear in mind : 1) The Italian Governments sets up the principle of Regional Unions for the administration of all methods of transport, each in a defined

area, providing the necessary co-ordination and eliminating the methods of transport recognised as useless; 2) The lines with little traffic, which are not self-supporting, will be authorised to cease working, applying the subsidy, if any, wholly or in part, to automobile traffic; 3) By way of experiment, for one year, rates may be reduced without previous authorization.

If State control is necessary, it should be made flexible.

The President remarks that the preceding statements tend to call for Government intervention with a view to confining public transport undertakings to their proper sphere of operation, and to remedy the anarchy prevailing everywhere on the road.

Mr. Level (*Compagnie Générale de Voies Ferrées d'intérêt local, France*) intervenes to support the theory of necessary State intervention.

He considers that if the question which is under discussion requires a title, it should be worded « Co-ordination of transport ».

To remedy the anarchy in transport, it is perhaps advantageous to co-operate with the automobile, that is to say to work in common, but it is necessary to arrive at co-ordination, which requires the intervention of the Government. The railways are, in fact, unarmed and it is the duty of the State to defend its concessionnaires.

Mr. Level insist, therefore, in the most formal manner that co-ordination should be effective and, in this connection, he reminds the Meeting of the wishes expressed by Section V.

Mr. Henning (*Belgian National Ry. Co.*) stresses the importance of the question now under discussion, which has been dealt with in three Sections.

It should not be made to appear as if the very important improvements carried out by the railways in their working were only carried out under the pressure of automobile competition. There are other reasons for this, brought about by new requirements.

Besides, Mr. Henning remarks that the public road transport services do not respect the regulations of the road police. Thus, in Belgium it is prohibited to use lorries of more than 10 tons; now, it is perfectly well known that there are some of up to 15 tons. For this reason, road traffic presents grave dangers.

In the same way, the laws on working hours are not observed by the driving personnel.

Lastly, in Belgium there are examples of excessive leniency at the frontier customs stations for public road transport services.

Mr. Cancella de Abreu (*State Railways in the Portuguese Colonies*) also considers the problem as highly important and that it is necessary that the Governments take extraordinary measures.

In this respect, he is of the opinion that the summary of the Special Reporter no longer reflects the present situation.

The President remarks that, as has already been said, the situation has, in fact, become considerably aggravated since the reports were made on which Mr. Cox had based his special report. The remarks made would, therefore, be taken into account in the final summary.

Mr. Dorpmüller (*Deutsche Reichsbahn*) proceeds to propound to the meeting the question of automobile competition from the point of view of the great railways of national interest.

It is because these railways assure the life of the nation that they have been given a monopoly, and this monopoly should subsist if it is desired to safeguard the national interest.

The development of road transport has completely upset the regime of the railways whose returns are no longer assured. It is impossible to think of a tariff war which would resolve itself into the lowering of rates for valuable goods and at the same time the raising of rates for the transport of heavy goods which guarantee the national existence. This raising of rates, furthermore, would result in the transfer to inland waterways of a part of the traffic carried at present by the railways, which would make their position even more disastrous.

The idea of justice has been put forward as a remedy for the trouble caused by road transport. Mr. DORPMÜLLER considers that this idea is practically unrealisable.

Mr. DORPMÜLLER concludes with the necessity of the re-establishment of the monopoly, in such a way as to place in the same hands the two methods of transport. He cites as an example what has happened with the postal, the telephone and the radio services. The same thing will occur on the day when the only remedy has to be faced for the abusive liberty allowed at present to the automobile.

Mr. DORPMÜLLER considers that the monopoly can be granted in two forms : either by concession, or by State working of the automobile lines. He adds that the present moment would be particularly favourable for the State to acquire the existing public transport undertakings in order to re-establish the monopoly in one form or another.

— After this interesting statement by Mr. DORPMÜLLER, the Meeting adjourned at 11.30, and re-assembled at 3 p.m.

* * *

THE PRESIDENT, after opening the Meeting, referred to the instructive speech of Mr. DORPMÜLLER on re-establishment of the monopoly.

He was of opinion that this formula, which is a State formula, is of a much more absolute character than those which have been put forward in the course of the discussion, which tend to the regime of concessions.

He thinks there is unanimity of opinion that the Governments should be asked to interevene, but the regulations may vary with the conditions in each country.

It is with this in view that some Delegates have expressed willingness to get together and prepare the text of a summary which could be submitted to the Meeting.

Mr. DORPMÜLLER supports this remark, as it represents the great majority of opinions expressed. He considers that concessions would be a step forward, but he doubts its efficacy and considers that in the near future his idea of a monopoly will inevitably have to considered.

THE PRESIDENT thanks Mr. DORPMÜLLER for his concession to the opinion of the majority of the Meeting and commences to examine the text of the summary.

The summary was read, clause by clause, in French, it being understood that the French text would be taken as a basis and that the English and German translations would be carefully adapted to the French text.

A certain number of observations were made on various clauses, and finally the summary was agreed as follows :

First part : *Railways and road.*

Second part : *Railways and airways.*

Summary.

« I. — *Railways and road.*

« 1. The question of automobile competition, which was made the subject « of very serious consideration during « the Madrid Congress, is still far from « receiving the solutions recommended « in the summary of 1930. These must, « therefore, be maintained in their entirety inasmuch as, judging from the « reports produced at the present Session, the development of goods transport by road has been much increased « by the improvement and the extension « of the road lorry. The consequences « are as troublesome to the great Systems « as to the Railways of local interest.

« 2. In every country the railways have « been seriously handicapped in their « efforts to preserve and increase their « traffic by the unequality of the conditions governing transport by road « and by rail. Since the commencement of their existence, the railways « have been the object of much legislation on the subject of precautions to « be taken in the interests of safety, « conditions of transport, the right to « establish rates and the publication of « tariffs. This legislation was justified « at its origin by the theory that the « railways enjoyed a virtual monopoly, « and that it was, therefore, necessary « to protect the public in different « ways; it continues to be so for the « consideration that the railways should « serve the general interest.

« 3. The result is that the railways, « which have heavy expenses — especially for the maintenance and improvement of the permanent way — are « subject as well to taxation, particularly heavy in certain countries, and to « heavy obligations in respect of transport and of safety, whereas the automobile undertakings have every liberty « in fixing their schedules and their « rates as well as in their choice of « traffic. They use this liberty to take « the cream off the traffic normally remunerative to the railways, which « leads to the inevitable consequence of « obliging the latter, in order to save « disaster, to increase, to the great prejudice of the general economy, the « tariffs now in force upon heavy merchandise or goods of first necessity.

« The automobile road transport undertakings escape, in addition, in great « part the expenses and obligations of « the railways, often even in regard to « the conditions of remuneration and « work of their personnel. They even « benefit in some countries from great « tolerances in the application of the « road police regulations affecting them, « and from customs facilities at the « frontiers.

« However, the railway has, like every « other undertaking, right to a fair distribution of obligations and expenses. « If this idea of equity cannot be resolved in the same manner everywhere, « the tendency must manifest itself in « each country according to its own conditions.

« 4. The statements presented to the « Congress indicate a certain number of « measures adopted in different countries with the object of establishing « a certain equality between the two methods of transport.

« Since, measures of the same nature « have been taken in some countries, or « are on the verge of being put into force « in others.

« It is certain that unregulated com-

« petition between forms of surface « transport is extremely prejudicial and « causes economic losses, and that the « low cost of certain types of road trans- « port is more apparent than real, in « view of the fact that the high cost of « the roads is not equitably supported « by the road transport, but recoils on « the public. In other words, the road « transport industry in this way is sub- « sidised by the rate-payers.

« 5. First of all, it is necessary that « the State should lighten the regulations « imposed on the railways in order to « enable them to modernize their meth- « ods, with a view to giving the public « the same satisfaction as the automobile, « without their being obliged to have re- « course to a tariff war which would be « disastrous for the general economy.

« 6. The condemnation of such a tariff « policy brings logically in its train « measures affecting public transport by « automobile. To avoid the competition « prejudicial to the national general econ- « omy, to maintain public automobile « transport in the form of a normal use « of the road, to regulate its organisation « and circulation as the execution of a « public service requires, these are meas- « ures that are not contrary to progress « and which would conciliate the inter- « ests concerned if direct understandings « could usefully intervene between the « railways and public road transport un- « dertakings.

« Co-ordination would leave each me- « thod of transport to fulfil its own role « for the good of the public and the aim « of regulation would be purely policing. « But such direct understandings are « generally made difficult by the dissem- « ination of road transport and its par- « ticularism.

« The railways have notwithstanding « endeavoured in every way to co-ordin- « ate the two methods of transport. In « countries like Great Britain, where the « railway companies did not possess ge- « neral powers for operating road ser- « vices, these powers have now been « granted.

« In a general manner, it may be said « that, whether by means of road trans- « port services run directly by the rail- « ways, or by agreements with the auto- « mobile lines, the railways have en- « deavoured to co-ordinate the two ser- « vices so that :

« *a*) The one becomes an affluent of « the other, especially in the case of « passenger transport;

« *b*) Transport of goods from door to « door may be effected by the creation of « well organised collection and delivery « services.

« 7. The railways have not ceased to « take measures for improving their or- « ganisation.

« They have accelerated their passenger « services. They have often themselves « utilised automobiles. They have gone « into the question of general employ- « ment of rail motor cars, which con- « stitute in some cases economic, rapid « and comfortable means of transport.

« Some railways have not hesitated to « go to heavy expenses in electrifying « lines with heavy traffic, giving them « an up-to-date signalling.

« As regards the good services, the « railways have also remarkably acceler- « ated the rapidity of transport and have « reduced the period for delivery. They « have organised door to door services.

« They have had recourse to the use of « containers.

« They have given to users the facility

« of warehousing goods in the goods sta-
« tions.

« 8. To sum up, it is necessary that the
« railways continue the efforts they have
« made to still further improve their
« working methods, but it is necessary
« that they also receive from their Go-
« vernments the help and guarantee
« necessary in consideration of the gene-
« ral interest.

« For this purpose, the Congress re-
« cords the following resolution :

« The public service by rail, constitu-
« ting a national utility which has wholly
« preserved its value, fulfilling an econ-
« omic and social role, the advantages
« of which extend to all classes of the
« public, have the right to obtain from
« their Governments equality of legal and
« administrative regime for all methods
« of transport, as well as of the fiscal and
« other charges which they bear.

« It is, furthermore, incumbent on the
« Governments to ensure that means of
« transport shall be co-ordinated and to
« employ every possible means so that
« this co-ordination be realised without
« further delay, in a spirit of progress
« for the whole of the country.

« 2. — *Railways and airways.*

« Air transport, in its present state,
« does not present the same aspect of
« competition.

« In a general way, the aeroplane consti-
« tutes, for very long distances, such pro-
« gress that the railways can only con-
« tinue to facilitate working together with
« the aeroplane.

« There are, however, certain cases in
« which the State, by reason of subsidies
« granted to aeroplane services, should
« intervene in fixing the charges for
« transport, to avoid the competition of
« fered to the railways.

5th SECTION. — Light railways and colonial railways.

President : E. Mellini.
Vice-Presidents : T. C. Swallow, E. Lajthay and Dr. C. C. Wang.
Principal Secretary : A. Allard.

QUESTION XII.

Co-ordination of operation as between heavy and light railways.

Preliminary documents.

1st report (Continent of Europe), by Mr. L. Jacobs. (See *Bulletin*, May 1932, p. 775, or separate issue No. 10.)

2nd report (All countries except the Continent of Europe), by Mohamed Sobhi Ishak Effendi. (See *Bulletin*, September 1932, p. 1793, or separate issue No. 28.)

Special Reporter : Mr. L. Jacobs. (See *Bulletin*, January 1933, p. 154.)

Report of Section V.

(See *Daily Journal of the session*, No. 4, p. 5, and No. 5, p. 4.)

Meeting held on the 23 January 1933.

The Meeting is opened at 9.30 a.m. under the presidency of Mr. Mellini.

Mr. Jacobs (*Special Reporter*) is called upon to speak and he gives a summary of his special report.

The President is of the opinion that Summaries 3 and 4 rather relate to question XI.

Mr. Level (*Compagnie Générale de voies ferrées d'intérêt local, France*), finds Mr. Jacobs' report rather pessimitic with regard to the relations between main and light railways. He points out the excellent results obtained by the introduction of common tariffs. He shares the opinion of the President regarding summaries 3 and 4.

Mr. Jourdain (*Ch. de fer secondaires du Nord-Est, France*), proposes the insertion of a new conclusion which stresses the importance of the abolition of transit charges.

On the other hand, while admitting that Summaries 3 and 4 of the special report rather come under Question XI, yet he suggests that they be adopted in the form of wishes and be examined in the next joint Meeting of Sections III and IV.

Mr. de Souza (*Portuguese Government*) gives a few details regarding the situation in his country.

Mr. Henning (*Société Nationale des chemins de fer belges*) explains that in his country, where the development of the light railways is just as important as that of the main railways, the question of competition occurs between these two systems.

Mr. Lisboa de Lima (*State Rys. in the*

Colonies, Portugal) accepts the proposed conclusions and insists upon the sacrifices assented to in the Portuguese Colonies in order to bring about co-ordination.

Mohamed Sobhi Ishak Effendi (*Reporter*) is of the opinion that it should be recommended to Companies, which have the intention of establishing new light railways, to adopt the standard gauge track. Besides, he believes that it would be in the general interest of all parties concerned to avoid competition between main and light railways.

A general discussion takes place in which the above mentioned speakers participate. In the course of this discussion, Mr. Level proposes an addition to the new summary proposed by Mr. Jourdain.

The Assembly then took up each article separately.

Summary 1.—The text proposed by the Special Reporter is adopted with slight modifications suggested by Messrs. de Sousa, Marguerat (*Ch. de fer de Viège à Zermatt, Switzerland*) and Jacobs.

Summary 2.—Adopted with some alterations after a discussion in which Messrs. Level, Vandersypen (*Société Nationale des Ch. de fer belges*), Jacobs, Jourdain and Czapski (*Polish Government*) take part.

Summary 3.—The Meeting, taking as a basis the proposal of Messrs. Jourdain and Level, agrees on the wording shewn hereunder. Besides the above mentioned speakers, Mr. Crombe (*Compagnie générale d'entreprises électriques et industrielles « Electrobel »*) took part in the discussion.

The Meeting agrees also to express the following wishes which are the reproduction of articles 3 and 4 of the summary at the end of the special report drawn up by Mr. Jacobs, and which will be presented to the joint meeting of Sections III and IV for the discussion of Question XI. Participate in the discussions : The said speakers; Mr. Bouteau (*Compagnie générale des Chemins de fer vicinaux, France*), and Dr. Wang (*Chinese Government, and Vice-President of the Section*).

Wishes expressed :

1. — Public railway services — constituting an important part of the national equipment and fulfilling an economic and social function, the benefits of which, mainly of an indirect nature, generally extend to the whole national community — have the right to be defended against anything that tends to ruin their work, in order to allow them to evoluate and adapt themselves to the traffic requirements.

The advantages directly or indirectly enjoyed by other means of transport, would thus be taken into account.

2. — It is the duty of the central authorities to ensure that the transport policy is such that no undertaking likely to prejudice national economic interests can be started.

It is, therefore, their duty to prevent whatever might impede the modernisation and co-ordination of the main railways and light railways and, in particular, economically unjustifiable duplication which makes profits for private interests at the expense of the general interest.

For the same reasons it is incumbent upon the Governments to take all possibles steps to see that this co-ordination is accomplished, and in a manner condu-

cive to the progress of the country as a whole.

— The summary adopted by the Section is worded as follows :

Summary.

« 1. The most essential principle which « must govern all co-ordination, and in « particular co-ordination between main « and light railways, is first of all the « defence of the public interest, that is « to say, the safeguarding of the public « economy.

« 2. The interests of the railways « should coincide with the general in- « terest of the nation : this is the prin- « cipal criterion for any sound railway « co-ordination.

« 3. It would be desirable to abolish « taxes imposed upon the transit of « goods, in cases where they would result « in the turning away of traffic which « otherwise would be handled by the « railways.

« In this respect it would be worth « calling the attention of Governments « to the need for a rapid examination in « each case, and to authorise provision- « ally the application, of special rates or « common tariffs proposed by railways, « as is done in some countries. Only « these measures will permit to con- « tinually follow up the requirements of « the traffic. »

— This summary was ratified by the Plenary Meeting held on the 24 January.

QUESTION XIII.

Use of rail motor cars on secondary railway lines.

Preliminary documents.

1st report (Great Britain, Dominions and Colonies, United States of America, China and Japan), by Mr. A. D. J. Forster. (See *Bulletin*, April 1932, p. 451, or separate issue No. 4.)

2nd report (Continent of Europe, except Italy), by Mr. F. Level. (See *Bulletin*, June 1932, p. 1133, or separate issue No. 17.)

3rd report (Italy and Colonies, Africa, except the British Dominions and Colonies, Latin America), by Messrs. La Valle and Mellini. (See *Bulletin*, September 1932, p. 1801, or separate issue No. 29.)

Special Reporter : Mr. E. Mellini. (See *Bulletin*, January 1933, p. 161.)

Report of Sections III and V combined.

(See *Daily Journal of the session*, No. 6, p. 5, and No. 7, p. 8.)

Mr. Mellini, President of the 5th Section proposes that Mr. Margot, President of the 3rd Section, should preside over the Meeting. (*Approved.*)

Mr. Margot, taking the Chair, thanks Mr. Mellini and invites him, as Special Reporter, to expound the question .

Mr. Mellini explains that the results communicated to the London Congress and also to the Madrid Congress were not very important. Now, the conditions have changed : the financial position of the railways and automobile competition have forced the Administrations to endeavour to increase speed, to increase the number of trains, to make carriages with a lower axle load. The reports prepared for the present Congress do no longer respond exactly to the present situation. It would be useful, however, to re-read the summary of the special report and introduce modifications in the light of the inform-

ation which may be obtained in the course of the discussion.

Mr. F. Level (*Reporter*) remarks that the reports have been written on the basis of a questionnaire drawn up eighteen months ago and that the summary at which they arrive is without doubt correct but, perhaps, too precise. He particularly wishes to avoid a too imperative wording in regard to the power at which electric transmission should be adopted and in regard to the employment of double control. The secondary lines have been employing, for about ten years, rail motor cars which have given interesting results. These rail motor cars may also, on the great railway systems, lead to a reduction of working costs. It is possible, for instance, to adopt the one-man-drive and to organize the working by sections blocked by telephone.

Mr. La Valle (*Reporter*) gives an account of the trials made in Italy, in 1932, with two-bogie Fiat rail motor cars weighing 12 1/2 tons (empty), with 48 seats and room for 22 standing passengers, fitted with a 120-H.P. petrol motor giving a maximum speed of 120 km. (85 miles) per hour.

Mr. de Souza (*Portuguese Government*) wishes to know, in the light of experience of other Railways, what would be the type of rail motor car to be adopted for secondary lines. It appears to him that the tendency of the railways is to adopt light rail motor cars with a Diesel engine. He particularly seeks information on road-railers.

Mr. Jacobs (*Société Nationale des Chemins de Fer Vicinaux, Belgium*) in reply to Mr. de Souza, states that the use of rail motor cars designed by his system have reduced the cost of the car-kilometre to 3.50 Belgian francs as against 7.50 to 7.00 Belgian francs per steam train-kilometre. However, this considerable reduction of working cost is less important than the recovery of traffic. This recovery has reached on 7 or 8 lines as much as 50 to 100 %, and has resulted in the road motor cars going out of business. At present the question of replacing petrol motors by heavy oil motors is being investigated.

Mr. Seefehlner (*Austrian Federal Railways*) remarks that the use of the rail motor car is especially justified when it can be driven by one man, and he asks the meeting to record a wish that the Governments should authorize this method of working.

The President mentions to the Section that it would be difficult to incorporate in the summary very detailed information, but he thinks that, after approval of the summary, a resolution could be recorded that the Permanent Commission of the Congress should be informed by the Administrations as to the progress effected, which would form the subject of a publication in the *Bulletin of the Railway Congress*.

Mr. Level remarks that the transformation of ordinary vehicles into rail motor cars costs much less than the purchase of new cars. He himself has had rail motor cars made in this way, giving a speed of 60 kilometres (37.3 miles per hour), and not costing more than 100 000 francs.

At 10.20, the Meeting closes until 11.35 in order to enable a new summary to be drawn up.

Mr. Mellini reads the new summary, altered so as to take into account the observations presented.

Mr. JACOBS asks that the qualification « comfortable » be added in Clause 4.

Mr. JOURDAIN (*Chemins de Fer Secondaires du Nord-Est, France*) is of the opinion that the use of too light motors should be avoided. On his system they have passed, according to the type of vehicle, from 40 to 80 H.P. and from 80 to 150 H.P., substituting, however, for the petrol motor, the Diesel motor with which the additional consumption is not of much importance.

Mr. SAVARY (*Swiss Federal Railways*) holds that the power of the moter should not be too great, otherwise economy disappears.

THE PRESIDENT suggests to solve the question by requiring that the reserve power should be in accordance with the profile of the line. At the request of Mr. JOURDAIN, this indication is replaced by the notion of a sufficient reserve power to avoid working the engines continuously at their maximum power.

Following a question by Mr. HENNING *(Société Nationale des Chemins de fer belges)*, in regard to the use of rail motor cars not only on secondary lines but also on the great systems, it is decided that the summary should include a special paragraph dealing with this point.

Finally the Meeting agrees to the text of the revised summary.

Meeting held on the 26 January 1933.

The Meeting opens at 9.45 a.m. under the presidency of Mr. MARGOT, President of the Third Section.

THE PRESIDENT points out that the summary has been modified in order to take account of the remarks made at the meeting, and especially that in article 4, at the request of Mr. JOURDAIN, the expression « a reserve power corresponding to the gradients of the line », has been replaced by the expression « a reserve power sufficient to avoid the constant working of the motors at their maximum capacity ».

THE PRESIDENT has the Summary read again in the three languages. It is approved without remarks.

Summary.

« 1. The use of rail motor cars which, « up to the present, has only provided « a solution of the question in isolated « cases, lends a new interest to the con- « sideration of automobile competition, « the development of which is occupying « the close attention of all Railways, not « only the large Companies but also those « of local interest.

« 2. The rail motor car can be con- « sidered as one of the systems of trac- « tion fulfilling the needs of lines with « little traffic and responding best to « the need for reduction of working « costs, especially when the vehicle can « be driven by one man only.

« The present tendency in the con- « struction of rail motor cars is towards « the use, more and more extended, of « heavy-oil motors and the employment « of more powerful cars.

« 3. Rapid transport, which the road « automobile endeavours to provide, re- « quires, to be adopted in a practical « manner on secondary lines, an en- « gine capable of increased commercial « speeds, and with a cost such that the « volume of the traffic can be increased « without extra charges.

« 4. The rail motor car should be an « easy working and comfortable machine, « specially capable of quick starting and « stopping, getting up speed rapidly, and « possessing a reserve power sufficient « to avoid the constant working of the « motors at their maximum capacity.

« In some cases the reserve power « could be utilised for drawing a trailer.

« It would be advantageous, particu- « larly for short journeys or for shuttle « services, to have a rail motor car that « can be run in both directions.

« 5. The employment of the rail motor « car can also be considered on the main « lines, for a better local service. »

— This summary was ratified by the Plenary Meeting held on the 30 January.

SUMMARY REPORT OF THE DISCUSSIONS AT THE GENERAL MEETINGS

(24 and 30 January 1933).

President : H. E. Ibrahim Fahmy Kerim Pasha.
General Secretaries : Messrs. P. Ghilain, Youssef Risgallah Bey, Dr. I. G. Levi and Fouad Hassib Bey.
Assistant General Secretaries : Sir Henry Fowler and Herr P. Wolf.

Meeting held on the 24 January 1933.

The Session opens at 9.30 a.m. under the Presidency of H. E. Ibrahim Fahmy Kerim Pasha, Minister of Communications, and President of the Session.

The Meeting first examines the summaries which have been arrived at by the various sections.

Mr. Ghilain (*General Secretary*) proposes to read only the French texts and leave the English and German texts to the English and German Assistant Secretaries, to make them correspond exactly to the texts approved.

— *Approved.*

SECTION I.

Question I. — Approved.

Question II. — Approved.

SECTION II.

Question IV. — Mr. Ghilain has been asked to have the words « intermediate repairs » in Article 4 substituted for « an intermediate repair ». The summary is adopted with this modification.

Question V. — Mr. Leboucher (*French Midi Rys., Reporter*) asks that the last part of Article I-5 be worded as follows : « where the traffic is proportionately heavier as the profile of the line is easier. »

This modification is accepted.

Mr. Fiori (*Permanent Commission*) asks that the words « the zone » in Clause III-3 be replaced by « the zones ».

The summary is adopted with this modification.

SECTION III.

Question VII. — Mr. Margot (*Permanent Commission* and *Paris-Lyons-Mediterranean Rys.*) asks that the 3rd clause of the summary be rectified as follows : « In the large number of cases in which

this constancy « is noticed », instead of « ...has been noticed ».

The summary is adopted with this alteration.

Question VIII. — Adopted.

SECTION IV.

Question X. — Mr. Wolf (*Assistant General Secretary*) makes a remark which only affects the German text, paragraph 7, clause 2.

Mr. Henning (*Belgian National Railway Co.*) states that the Delegates of Spain and Czechoslovakia have asked him to propose to the Meeting to complete Clause 7 by the following : « The question will be dealt with anew by a coming Congress, when the results of the several trials undertaken at present will be known. »

Mr. Ghilain replies that account will be taken of this suggestion, asking the Permanent Commission to include it again in the Agenda.

Mr. Ibl (*Czechoslovakian State*) asks that notice be taken in the second clause of Article 7, of the fact that the State Railways of Czechoslovakia have already carried out some tests.

Mr. Goonetilleke (*Ceylon Government Ry.*) thinks that the statement made by the Czechoslovakian Delegate to the section does not justify the inclusion of the proposal. It seems to be premature at present.

Mr. Henning proposes to abandon the proposal. Mr. Ibl has only made it in order to know whether paragraph 2 dealt with the experience obtained in Czechoslovakia.

The summary is then adopted without any modification.

SECTION V.

Question XII. — Adopted.

— The Meeting ends at 11.00 a.m.

Meeting held on the 30 January 1933.

The Meeting opens at 9.30 a.m. under the presidency of H.E. Ibrahim Fahmy Kerim Pasha.

1. — *Summaries.*

Questions III, VI, IX and XIII. — Mr. Ghilain (*General Secretary*) reads the summaries of questions III, VI, IX and XIII. They are approved without remark.

Questions XI. — Mr. Ghilain reads the summary of question XI.

Mr. Margot informs the Meeting that Sections III, IV and V, meeting jointly on the occasion of the discussion, were of the opinion that, when dealing with questions of such importance as this, it would be advantageous that annual reports were addressed to the Permanent Commission so as to keep the members of the Association properly advised, by means of the *Bulletin*, of the progress of the question.

Dr. Levi (*General Secretary*) asks that the question may be extended to the competition offered by inland waterways.

Sir Evelyn Cecil (*Permanent Commis-*

sion and Southern Railway, England) approves the proposition of Mr. MARGOT.

Mr. FOULON (*President of the Permanent Commission*) states that the Permanent Commission, at its last meeting, has already examined the question and has decided that Mr. MARGOT's proposal should be acted upon.

The General Secretariat will establish a programme of questions to be reported upon annually. The Meeting of the Permanent Commission in July next will decide in regard to this programme which will include inland waterways traffic.

Mr. A. NEWLANDS (*London Midland and Scottish Ry.*) supports the proposal but would like to see the question extended to the study of industries which organize their own transport.

Mr. GEVAERT (*Belgian National Light Railway Company*) is of opinion that taking into consideration the suggestion of Mr. NEWLANDS would be giving too much amplitude to the original proposition and that it should be abandoned.

Mr. MARGOT observes that, in the course of the discussions in the 4th Section, a remark made by Mr. IBL showed that this question was included in the main question exactly as it was set out (see p. 522 of this *Bulletin*).

Mr. BESSER (*Permanent Commission and German Government*) supports the proposition of Mr. MARGOT and remarks that the question covers not only transport by motor lorries but also private transport.

Mr. DE LA TORRE EGUIA (*Spanish Government*) considers that the word « equality » in the penultimate paragraph or Article I-8 of the summary should be replaced by the word « equity ». This substitution would be specially advisable from the point of view of the general interpretation of the summary from the English text.

Mr. MARGOT remarks that a similar observation was made in the Section and considers that it is out of order to discuss a word when Sections III, IV and V have agreed to adopt the proposed text. He asks formally that the text shall be maintained integrally.

No one having any other observations to make, the text of the summary, as it appeared in the *Daily Journal* is approved.

2. — *Increase in the number of Members of the Permanent Commission. Nominations, Renewal of mandates.*

THE PRESIDENT reminds the Meeting that it is the order to submit for the ratification of the Plenary Meeting the creation of new mandates of member of the Permanent Commission (see minutes of the Meetings of 18 October 1930, 23 July 1931 and 23 July 1932) which have been attributed as follows :

One to Bulgaria.
Two to Canada.
One to Austria.
One to Hungary.

— *Approved.*

In addition, THE PRESIDENT reminds the Meeting that it is the custom to grant to the Country which receives the Congress one or two supplementary mandates of member of the Permanent Commission.

He proposes the approval of the creation of two new mandates which should be granted to :

MAHMOUD CHAKER Bey, Under Secretary

of State, Ministry of Communications, and

Youssef Risgallah Bey Member of the Board of Management, State Railways, Telegraphs and Telephones.

Furthermore, Mr. Foulon proposes the nomination as life member of H. E. Ibrahim Fahmy Kerim Pasha, Minister of Communications.

These proposals are approved unanimously and with applause.

Mr. Ghilain (*General Secretary*) states that the following mandates, conferred by the Permanent Commission in the interval between the two Sessions (Madrid, 1930 and Cairo), are submitted for ratification by the Plenary Meeting :

Mr. Velani (nominated on the 18 October 1930).

Mr. Day (nominated on the 18 October 1930), already replaced by Mr. Swallow.

Mr. Chreplovitch (nominated on the 18 October 1930), already replaced by Mr. Knejevitch.

Mr. Dantschoff (nominated on the 25 July 1931) already replaced by Mr. Bochkoff.

Mr. Clews (nominated on the 25 July 1931).

Sir George McLaren Brown (nominated on the 25 July 1931).

Dr. C. C. Wang (nominated on the 25 July 1931).

Mr. van Marle (nominated on the 25 July 1931).

Chafik Pasha (nominated on the 17 December 1931).

Mr. Woo (nominated on the 17 December 1931).

Mr. Seefehlner (nominated on the 23 July 1932).

Mr. de Samarjay (nominated on the 23 July 1932).

Mr. Moreno Ossorio (nominated on the 23 July 1932).

Mr. Fukukawa (nominated on the 23 July 1932).

Mr. Jezierski (nominated on the 23 July 1932).

Mr. Knutzen (nominated on the 23 July 1932).

Mr. Chiossi (nominated on the 18 January 1933).

— *Approved with applause.*

Mr. Ghilain informs the Meeting that the mandates of the members of the Permanent Commission, as follows, are expiring : these members, with the exception of Mr. Oddone and Mr. Paul, whose mandate was extended exceptionally up to the Cairo Session (Article 6 of the Statutes) are re-eligible :

Messrs. Foulon.
Vickers.
Aishton.
Dautry.

Sir Francis Dent.

Messrs. Harvey.
Henry-Gréard.
Kejr.
Knutzen.
Loree.
Margot.
Maristany.
Oddone.

Sir Frederic Palmer.

Messrs. Paul.
Phillippe.
Rulot.
van Marle.
Wolf.

These members were re-elected with applause.

3. — *Intervals between the Sessions of the Congress Association and selection of the place for the XIIIth Session.*

THE PRESIDENT informs the Meeting that it would be desirable to revert to five years, as the interval between the Sessions. The proposition of Mr. MARGOT to request the Administrations to supply annual reports on questions of current importance allows all members of the Association to be kept informed of the progress as regards essential questions relating to railways. The Meeting approves the proposition to hold the next Session in 1938.

THE PRESIDENT states that two invitations have been received from which to choose the headquarters of the next Session. The first emanates from the JAPANESE GOVERNMENT who asked that TOKYO should be chosen for the XIIIth or XIVth Session; the second is from the FRENCH GOVERNMENT who wishes to have the 1938 Session in PARIS. The Meeting unanimously accepted the proposition to hold the XIIIth Session in Paris in 1938.

Mr. BETBEDER-MATIBET (*French Government*), in the name of the French Government, states that France will be very happy to receive the Congress.

— *Applause.*

THE PRESIDENT thanks the FRENCH DELEGATION for their charming invitation and at the same time thanks the JAPANESE GOVERNMENT for the invitation to hold the XIVth Session in Tokyo.

4. — *Current matters. Various communications.*

Mr. GHILAIN proposes to pass a vote of thanks to the AUDITORS who have been entrusted with the task of checking the accounts of the XIth Session, for the remarkable way in which they have carried out their mission.

— *Applause.*

Election of Auditors.

Mr. GHILAIN proposes to the Plenary Meeting the nomination of Sir HENRY FOWLER and Mr. BARRIOL as Auditors, to undertake the verification of the accounts of the XIIth Session.

— *Approved.*

The Meeting closes at 11.30 a.m.

CLOSURE OF THE SESSION

(30 January 1933).

The Meeting opens at 12 o'clock under the Presidency of H. E. Ibahim Fahmy Kerim Pasha, Minister of Communications.

Mr. Foulon, President of the International Railway Congress Association, rises and makes the following speech :

« Your Excellency,

« On behalf of the members of the Congress I trust you will permit me to say how much we all have appreciated the great compliment you have paid us by presiding over the meetings of this Congress. We wish to thank you very warmly for this and also for the interest you have taken in the work of the different sections.

« Your Excellency and Gentlemen,

« Amongst the questions on the agenda of the present session are some which quite particularly concern the very vitality of the railways.

« The discussions in the sections have demonstrated the importance you attach with such good reason to these questions.

« The cordial feeling displayed during the debates in question made it possible for the different theories to be developed convincingly. As a result we have extremely important resolutions which I consider represent very great progress towards the rehabilitation of the railways.

« Thanks to the energy of the railway managements the sane application of the resolutions which have been taken will restore the railways to their primacy in the economic life of the countries, a position they ought never to have abandoned. This is my deepest wish for the railways of all countries.

« If, moreover, you have been able to make the debates as complete as they have been and to devote yourselves entirely to the discussions, let me hasten to tell you, as no doubt you already know, this has been so because you had no other preoccupations to disturb you. You had nothing to think of except the main object for which you had met here. The Local Commission in fact thought of everything beforehand and organised in a truly admirable way, both for yourselves and your families, the many facilities and attractions needed to make your stay in this delightful country very agreeable. (*Applause.*)

« On your behalf I wish to thank the Local Commission very warmly. (*Loud applause.*)

« The work you have done has been based on the reports and special reports. We have all admired the way the reports have been prepared and have appreciated the work they have entailed.

« Allow me also in your name to thank the Reporters and Special Reporters. (*Applause.*)

« You have all noticed the industry and initiative displayed by the General Secretaries and Secretaries : the work they

have achieved has been really remarkable thanks to the devotion they have shown during the whole Session. We thank them too. (*Applause.*)

« Furthermore I would specially mention the various services, the perfect working of which you have been able to see for yourselves, which have organised the publication and distribution of the *Bulletin*, the postal service, and many others, the list of which is too long to give.

« On behalf of all the members of the Congress I offer to all these collaborators with the Local Commission our most sincere thanks. (*Applause.*)

« Finally, I would like to express to the Press the good feelings we have towards them. The Press has not only helped us during the Session, but is now going to assist us in broadcasting throughout the world the resolutions you have come to and the principles you have laid down during this Session. We thank the Press most warmly. (*Loud applause.*)

« In order to complete what I had to say to you, I now propose to acclaim the name of His Majesty King Fouad Who so well personifies this great country which has welcomed us in such a magnificent way (*Prolonged applause.*) »

H. E. the Minister of Communications congratulates the delegates on the work accomplished and the results obtained, and wishes the members of the Congress an agreeable continuation of their stay in Egypt and a happy return to their respective countries.

His Excellency thanks the Permanent Commission for his appointment as life member and for the applause which greeted this announcement.

His Excellency then declares the XIIth Session closed, and, on rising, is greeted with long and enthusiastic cheers.

List of Members of the Permanent Commission

OF THE

INTERNATIONAL RAILWAY CONGRESS ASSOCIATION

after the decisions taken at the General Meeting held on the 30 January 1933 (Art. 6 of the Rules and Regulations).

President :

E. **Foulon** (3), directeur général de la Société Nationale des chemins de fer belges; rue du Progrès, 74, Brussels;

Vice-Presidents :

C. **Colson** (2), membre de l'Institut, inspecteur général des ponts et chaussées, vice-président honoraire du Conseil d'Etat de France, membre du Conseil supérieur des chemins de fer de France; rue de Laplanche, 2, Paris;

U. **Lamalle** (2), directeur de l'exploitation à la Société Nationale des chemins de fer belges; rue de Louvain, 17, Brussels.

Members of the Executive Committee :

The Right Hon. Sir Evelyn **Cecil** (1), G. B. E., privy councillor, director, Southern Railway (Great Britain); 2, Cadogan Square, London, S. W. 1;

P. E. **Javary** (1), directeur de l'exploitation de la Compagnie du chemin de fer du Nord français; rue de Dunkerque, 18, Paris;

D. **Vickers** (3), director, London Midland & Scottish Railway; Chapel House, Charles Street, Berkeley Square, London, W. 1.

Ex-presidents of sessions, members ex-officio :

The Right Hon. Viscount **Churchill**, G.C.V.O., chairman, Great Western Railway (Great Britain); Paddington Station, London, W. 2;

J. **Gaytân de Ayala**, ancien président du Conseil des travaux publics d'Espagne; Villa Ulialde, San Sebastian;

H. E. Ibrahim Fahmy **Kerim** Pasha, Minister of Communications of Egypt; Cairo.

Members :

R. H. **Aishton** (3), president, American Railway Association; 30, Vesey Street, New York;

W. W. **Atterbury** (1), president, Pennsylvania Railroad Company; Broad Street Station, Philadelphia, Pa.;

F. **Besser** (1), Ministerialrat, Reichsverkehrsministerium; Wilhelmstrasse, 80, Berlin, W. 8;

L. **Bochkoff** (2), ingénieur, directeur général des chemins de fer et des ports de l'Etat bulgare; Sofia;

J. **Castiau** (2), secrétaire général du Ministère des Transports de Belgique; rue de la Charité, 25, Brussels;

H. **Caufriez** (1), directeur général de la Société Nationale belge des chemins de fer vicinaux; rue de la Science, 14, Brussels;

The Right Hon. Sir Evelyn **Cecil**, G. B. E., (already named);

Mahmoud **Chaker** Bey (3), under secretary of State, Ministry of Communications of Egypt; Cairo;

Chiossi (3), vice-directeur général des chemins de fer de l'Etat italien; Rome;

The Right Hon. Viscount **Churchill**, G. C. V. O. (already named);

P. A. **Clews** (2), European traffic manager, Canadian National Railways; 17-19, Cockspur Street, London S. W. 1;

C. **Colson** (already named);

R. **da Costa Couvreur** (1), ingénieur en chef de la division de la voie et des travaux de la Direction générale des chemins de fer, membre du Conseil supérieur des chemins de fer du Portugal; Bairros Sociaes, Arco de Cego, Rua A, No. 4, Lisbon;

---

(1) Retires at the 13th session.
(2) Retires at the 14th session.
(3) Retires at the 15th session.

Dautry (3), directeur général des chemins de fer de l'Etat français; 20, rue de Rome, Paris;

Sir Francis **Dent** (3), C. V. O., director, Southern Railway (Great Britain); Dock House, Beaulieu (Hants), England;

de Samarjay (1), secrétaire d'Etat, président de la Direction générale des Chemins de fer royaux de l'Etat hongrois; Andrâssy ut, 73, Budapest VI;

Dr. **Dorpmüller** (1), Generaldirektor der Deutschen Reichsbahn-Gesellschaft; 35, Voss-Strasse, Berlin W. 9;

F. **Fiori** (1), ingénieur, administrateur des chemins de fer de l'Etat italien; Villa Patrizi, Rome;

M. **Fontaneilles** (2), inspecteur général des ponts et chaussées, président de la section des chemins de fer au Conseil général des ponts et chaussées de France, président du Conseil de réseau des chemins de fer d'Alsace et de Lorraine; rue de Sèvres, 4, Paris;

E. **Foulon** (already named);

Sir Henry **Fowler** (2), K. B. E., assistant to vice-president (research and development), London Midland & Scottish Railway; Derby;

Dr. T. **Fukukawa** (2), manager of the Office of the Japanese Government Railways; Friedrich Ebert-Strasse, 6, Berlin W. 8;

J. Gaytán de Ayala (already named).

The **General Manager** of the Egyptian State Railways, Telegraphs and Telephones (3); Cairo;

P. **Ghilain** (2), ingénieur en chef au service du matériel de la Société Nationale des chemins de fer belges; rue du Progrès, 74, Brussels;

A. **Granholm** (2), directeur général des chemins de fer de l'Etat suédois; Stockholm;

H. N. **Gresley** (2), chief mechanical engineer, London & North Eastern Railway; King's Cross Station, London, N. 1;

Grimpret (2), conseiller d'Etat, directeur général des chemins de fer au Ministère des Travaux publics de France; 244, boulevard St-Germain, Paris;

R. J. **Harvey** (3), consulting engineer to the Government of New-Zealand; 34, Victoria Street, Westminster, London, S. W. 1;

Henry-Gréard (3), directeur de la Compagnie du chemin de fer de Paris à Orléans; rue de Londres, 8, Paris;

H. **Hunziker** (1), ingénieur, directeur de la division des chemins de fer du Département fédéral des postes et des chemins de fer suisses; Berne;

Sir Cyril **Hurcomb** (1), K. B. E., C. B., secretary to the Ministry of Transport (Great-Britain); 6, Whitehall Gardens, London, S. W. 1;

A. **Jacques** (1), directeur de la voie à la Société Nationale des chemins de fer belges; rue de Louvain, 17, Brussels;

P. E. **Javary** (already named);

H. **Jezierski** (1), conseiller ministériel au Ministère des Communications de Pologne; Warsaw;

E. **Kejr** (3), ingénieur, conseiller des constructions du département V/1 au Ministère des chemins de fer de Tchécoslovaquie; Prague;

H. E. Ibrahim Fahmy **Kerim** Pasha (already named);

D. **Knejevitch** (2), directeur général adjoint des chemins de fer de l'Etat yougoslave; Belgrade;

P. **Knutzen** (3), directeur général des Chemins de fer de l'Etat danois; Sölvgade, 40, Copenhague, K.;

U. **Lamalle** (already named);

L. F. **Loree** (3), president, Delaware & Hudson Railroad; 32, Nassau Street, New York City;

Sir George **McLaren Brown** (2), K. B. E., European general manager, Canadian Pacific Railway; 62, Charing Cross, London S. W. 1;

---

(1) Retires at the 13th session.
(2) Retires at the 14th session.
(3) Retires at the 15th session.

A. **Mange** (1), administrateur de la Compagnie du chemin de fer de Paris à Orléans, président du Comité de gérance de l'Union internationale des chemins de fer; rue de la Bienfaisance, 42, Paris;

C. **Marchi** (1), député au Parlement italien, président général de la Confederazione nazionale fascista dei trasporti terrestri e della navigazione interna; via Quattro Fontane, 149, Rome;

M. **Margot** (3), directeur général de la Compagnie des chemins de fer de Paris à Lyon et à la Méditerranée; rue Saint-Lazare, 88, Paris;

A. **Marguerat** (1), directeur des Compagnies de chemins de fer de Viège à Zermatt, Furka-Oberalp, Gornergrat et Schöllenen; Lausanne;

E. **Maristany** (3), marquis d'Argentera, directeur général de la Compagnie des chemins de fer de Madrid à Saragosse et à Alicante; Estación de Atocha, Madrid;

C. **Mereutza** (2), sous-directeur général des Chemins de fer roumains; Bucarest;

G. **Molle** (1), secrétaire technique à la Direction générale de la Société Nationale des chemins de fer belges; rue de Louvain, 17, Brussels;

L. **Moralès** (2), vice-président du Conseil supérieur des chemins de fer d'Espagne, président du Conseil d'administration des chemins de fer de l'Ouest de l'Espagne, Estación de las Delicias, Madrid;

J. **Moreno Ossorio** (1), directeur de la Compagnie des Chemins de fer du Nord de l'Espagne; Madrid;

Sir Frederic **Palmer** (3), C. I. E., consulting engineer, Office of the High Commissioner for India; 55, Broadway, Westminster, London, S. W. 1;

G. **Philippe** (3), inspecteur général des lignes Nord belges; Liége;

P. **Riboud** (2), directeur de la Compagnie des chemins de fer de l'Est français; rue d'Alsace, 21, Paris;

Youssef **Risgallah** Bey (3), member of the Board of Management, Egyptian State Railways, Telegraphs and Telephones; Cairo;

N. **Rulot** (3), directeur général a. i. de la Société Nationale des chemins de fer belges; 17, rue de Louvain, Brussels;

A. **Schrafl** (2), président de la Direction générale des chemins de fer fédéraux suisses; Berne:

Dr.-Ing. **Seefehlner** (2), directeur général des chemins de fer fédéraux autrichiens; Schwarzenbergplatz, 3, Vienna;

Sir Josiah **Stamp** (2), G. B. E., D. Sc., chairman and president of the Executive, London Midland & Scottish Railway; Euston Station, London N. W. 1;

T. C. **Swallow** (3), advisory engineer, Office of the High Commissioner for the Union of South Africa; South Africa House, 73, Strand, London W. C. 2;

Sir Henry **Thornton** (3), K. B. E., chairman and president, Canadian National Railways; Montreal, Que.;

Antonio **Valenciano y Mazerès** (2), inspecteur général des ponts et chaussées, administrateur de la Compagnie des chemins de fer de Madrid à Saragosse et à Alicante; General Oráa, 5-3º, Madrid;

H. **van Manen** (1), directeur des chemins de fer néerlandais; Utrecht;

Th. M. B. **van Marle** (3), inspecteur général des chemins de fer et tramways néerlandais; Koningskade, 25, The Hague;

L. **Velani** (1), directeur général des chemins de fer de l'Etat italien; Villa Patrizi, Rome;

D. **Vickers** (already named);

---

(1) Retires at the 13th session.
(2) Retires at the 14th session.
(3) Retires at the 15th session.

Sir Ralph Lewis **Wedgwood** (1), C. B., C. M. G. chief general manager, London & North Eastern Railway; King's Cross Station, London, N. 1;

D. **Willard** (1), chairman of the Board, American Railway Association; president, Baltimore & Ohio Railroad; Baltimore, Md.;

P. **Wolf** (3), Geheimrat, Direktor der Deutschen Reichsbahn-Gesellschaft und Mitglied des Direktionsausschusses dieser Gesellschaft; Voss-Strasse, 35, Berlin, W. 9;

K. Y. **Woo** (2), director of the European Bureau of the Ministry of Railways of the National Government, Republic of China; 41, rue de Liége, Paris;

N... (2) (Argentine);

N... (1) (Australia);

N... (1) (Brazil);

N... (2) (Germany);

N... (2) (Germany);

N... (3) (Germany).

Honorary member : Gustav **Behrens,** director, London Midland & Scottish Railway; 20, Chepstow Street, Manchester.

SECRETARY'S OFFICE : rue du Progrès, 74, Brussels.

General secretary : P. **Ghilain** (already named).

Assistant secretaries : R. **Desprets,** ingénieur principal à la Société Nationale des Chemins de fer belges;

E. **Minsart,** ingénieur principal à la Société Nationale des Chemins de fer belges;

A. W. **Chantrell,** ingénieur principal à la Société Nationale des Chemins de fer belges.

---

(1) Retires at the 13th session.
(2) Retires at the 14th session.
(3) Retires at the 15th session.

RECEPTIONS AND EXCURSIONS

16 January 1933.

Reception by the Municipality of Alexandria.

On Monday, the 16 January, the Delegates of the International Railway Congress Association who arrived by the SS. *Champollion* as well as those who arrived in Egypt on the previous days were welcomed at the landing place by a representative of the Municipality of Alexandria. Motor cars were put at the disposal of the Members.

About 2.30 p.m. a trip took place through the town and the suburbs, under the guidance of Mr. J. Coatsworth, Assistant General Manager of the Municipality of Alexandria, in the course of which the Delegates visited, amongst other places, the Antoniades and Nouzha Gardens and the Greco-Roman Museum.

After the trip, towards 5.30 p.m., the Members of the Congress went to the Claridge's Hotel where the Municipality gave a tea Party in their honour, to which Egyptian and Foreign Personalities had been invited, as well as the Notabilities of the various Countries.

The Congressists were welcomed by H. E. Hussein Sabry Pasha, Governor of the Town of Alexandria and President of the Municipal Commission, and Ahmed Seddik Bey, General Manager of the Municipality.

In the course of the Party, Mr. Foulon, President of the Permanent Commission of the Congress Association, thanked the Municipality for the friendly reception offered to the Members of the Congress. He also praised the town of Alexandria.

H. E. Sabry Pasha replied, thanking Mr. Foulon for his kind apprecation and expressing the pleasure felt by the Town of Alexandria in welcoming the eminent Members of a World-wide Congress before they left for the Capital to carry out their task.

20, 21, 23, 24 and 25 January.

During the Session, five excursions were organised for the visit of the town of Cairo and vicinity. They took place on the 20, 21, 23, 24 and 25 January; the Delegates were divided into five groups and attended in turn the following trips:

1. The Mosque of Amr, Coptic Church and Museum, and the part of the town known as « Old Cairo ».

2. The Pyramids, Sphinx and Sphinx Temple; after their visit of these famous monuments, the Members were invited to tea in the gardens of the Mena House Hotel.

3. The Citadel, Mosques of Mohamed Ali and of Sultan Hassan, and the Arabian Art Museum.

4. Trip by motor car to Memphis and the Necropolis of Sakkarah containing the Tombs of the Sacred Oxen and those of Tih and Ptah-Hotep.

5. Trip by boat to the Nile Dams, which was particularly appreciated by the Members, who on this occasion visited the Great Dam, the beautiful Gardens and the Museum containing the small-scale models of the various Nile Dams and of the Egyptian Irrigation works. Tea was served in the Gardens.

20 January.

At 9 p.m. the Delegates went to the Institute of Oriental Music, Cairo, where they attended an excellent concert to which several Egyptian Artists of great talent contributed. Then followed Oriental classic

Entertainment at the Oriental Music Institute, on the 20th January 1933.

Banquet given by H. E. the Minister of Communications, at the Heliopolis Palace Hotel, on the 24th January 1933.

dances, on Arabian motives, performed by pupils of the Institute under the guidance of Mr. Moustapha El Akkad.

21 January.

At 9.30 p.m. a reception was given by His Majesty King Fouad at the Abdine Palace. After the Delegates of the various Governments and the Members of the Permanent Commission had been introduced to Him, His Majesty passed through the rooms where the Members had gathered, and thence to the Palace's theatre where talented artists from the Cairo Opera-House performed an act of « Die Fledermaus », by Strauss. After the play, the party took to the reception rooms and were able to refresh themselves at the spendid buffets specially set up for the occasion.

24 January.

At 8.30 p.m., a banquet was offered at the Heliopolis Palace Hotel by His Excellency Ibrahim Fahmy Kerim Pasha, Minister of Communications.

After dinner, Mr. Foulon, President of the Permanent Commission, rose and most warmly thanked H. E. the Minister of Communications; in his speech he exalted the beauty of Egypt, this Land of Mistery, which unites the past and the present by an harmonious transition and offers to visitors the poetry of undescribable vistas and subtilely blended lights; he laid stress on the admirable progress of Egypt's intellectual and economic activity. Mr. Foulon also warmly thanked the Local Committee for the splendid organisation of the Congress.

H. E. the Minister of Communications, who presided, expressed his feelings of sincere sympathy towards the Countries who are Members of the Congress and all the Delegates.

26 January.

At 9.30 p.m., a reception was given by H. E. the Prime Minister, in the rooms of the Semiramis Hotel. This was a particularly pleasant evening; the guests were able to resort to the ball room and to the splendid buffets set up; the song and dance interludes were much applauded and contributed to the charm of this brilliant reception.

31 January.

On that day several special trains made up of dining and sleeping cars took the Delegates to Luxor or Assuan, according to the groups to which they belonged.

Excursion to Assuan, 1 February.

The Members who arrived at Assuan in the morning of the 1 February were taken, immediately after their installation at their hotel, to the Red Granite Quarries, which provided the material for most of the obelisks. Then followed a trip by boat to the remains of the former Philae Island and Temple and to that grand and imposing structure, the Assuan Dam, nearly 6 500 feet long, and which cuts right across the first Nile Cataract a little below the Philae Island. From the platform of the Dam, the Delegates were able to contemplate one of the most beautiful landscapes that can be seen. The Delegates were then taken back to the hotel for lunch and were left to spend the afternoon at their own leisure.

2 February.

In the morning a trip by motor car was organised to the Alabaster Quarries and to a Beshareen (Sudanese natives) camp; these provided a particularly original show, thanks to their war dances, and fights. On their way back, Delegates visited the Town and the Bazars.

The afternoon was devoted to a visit of the famous Elephantine Island, the Museum and the Nilometer.

Excursion to Luxor, 3 February.

The journey from Assuan to Luxor was made in the morning; in the afternoon, the

Congressists went to the Temple of Luxor, and were thereafter taken, along the Sphinx Avenue, to the Temple of Karnak, one of the most wonderful ruins of Ancient Egypt.

4 February.

The morning was devoted to a trip by motor car to Ancient Thebes and the Valley of the Kings; the most important Tombs were visited, amongst which that of Tut-Ank-Amon.

The party lunched at Cook's Rest House after which a visit was paid to the Temple of Queen Hatasu, the Tombs in the Valley of the Queens and particularly Queen Nefertari's Tomb.

The remainder of the afternoon was spent in visiting the Temples of Medinet-Habu and of Rhamses, the Ramesseum and the Colosses of Memnon.

5 February.

For the return journey, a special train left Luxor at 8 a. m. Lunch, tea and dinner were served on the train and the Delegates reached Cairo in the evening, delighted by the never to be forgotten excursion to Upper Egypt which had been offered to them.

* * *

One of the groups of Delegates made the excursion to Upper Egypt in the reverse direction, i. e. visited Luxor before Assuan. Another group only went as far as Luxor and returned to Cairo on the 3 February.

MONTHLY BULLETIN

OF THE

INTERNATIONAL RAILWAY CONGRESS ASSOCIATION

(ENGLISH EDITION)

PUBLISHING and EDITORIAL OFFICES: 74, RUE DU PROGRÈS, BRUSSELS.

Yearly prepaid subscription { **Belgium . . . . . 70 Belgas** / **Other countries . . 75 Belgas** } including postage

Price of this single copy: 8 Belgas (not including postage).

(1 Belga = 5 Belgian francs.)

Subscriptions and orders for single copies (January 1931 and later editions) to be addressed to the General Secretary, International Railway Congress Association, 74, rue du Progrès, Brussels (Belgium).

Orders for copies previous to January 1931 should be addressed to Messrs. Weissenbruch & Co. Ltd., Printers, 49, rue du Poinçon, Brussels.

Advertisements: All communications should be addressed to the Association, **74, rue du Progrès, Brussels.**

CONTENTS OF THE NUMBER FOR JUNE 1933.

CONTENTS.	Page.
I. New type 1 A-2, 400-H. P. **steam rail cars** for the Turkish State Railways, by AD.-M. HUG	549
II. The **Diesel motor applied to railway traction**, by G. DELANGHE	559
III. Recent **locomotive types of the French Nord** Railway	573
IV. Why some **roadbads hold water and how to get rid of it**	578
V. Burrow under fill to **stop slides**	584
VI. **Speed signalling on the London Midland and Scottish Railway**	592
VII. A new **centralised traffic control installation**	601
VIII. The « **R apparatus** » **for the automatic braking of wagons** in hump marshalling yards	607
IX. New 410-H. P. **lightweight Diesel engine**, by E. W. HEINZE	613
X. MISCELLANEOUS INFORMATION:	
1. **Safety device for electrically-operated points**, by C. CHOUQUET	616
2. New **portable point spraying plant**	617
3. A new **steel sleeper**	618
4. **Level crossing protection** in Argentina	619

CONTENTS (*continued*). Page.

XI. NEW BOOKS AND PUBLICATIONS:

American Railway Signaling Principles and Practices: Chapter XIV, Definitions. — Chapter XVII, Mechanical and Electromechanical Interlocking. — Chapter XX, Interlocking circuits —, by the SIGNAL SECTION of the AMERICAN RAILWAY ASSOCIATION 622

XII. OBITUARY:
Sir Henry W. THORNTON 623

XIII. MONTHLY BIBLIOGRAPHY OF RAILWAYS. 67

LIBRARY

OF THE

Permanent Commission of the International Railway Congress Association.

READING ROOM: **74, rue du Progrès, Brussels.**

Works in connection with railway matters which are presented to the Permanent Commission are mentioned in the « Bulletin ». They are filed and placed in the library. If the Executive Committee deems it advisable they are made the subject of a special notice. Books and publications placed in the reading room may be consulted by any person in possession of an introduction delivered by a member of the Association. Books, etc., may not be taken away except by special permission of the Executive Committee.

The Permanent Commission of the Association is not responsible for the opinions expressed in the articles published in the Bulletin.

All original articles and papers published in the BULLETIN are copyright, except with the consent of the Authors and the Committee.

Editions in **French** and in **German** are also published.